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THE INFLUENCE OF WAR ON MEDICAL SCIENCE*

JAMES EWING, M.D.

NEW YORK

The influence of medical science on the conduct of war has been strikingly illustrated in all the great conflicts of the last two decades. On the other hand, the influence of war on medical science is less frequently considered; but the present conflict seems likely to exert a far-reaching effect on American medicine.

The last example of a war conducted without the aid of medical science was our own brief passage at arms with Spain. Here, pestilential disease broke out in violent epidemic form in all the camps; malaria and dysentery more than decimated the troops in Cuba, who were saved from annihilation by these diseases and yellow fever only by prompt removal from the danger zone. I saw whole shiploads of acutely ill soldiers landed at Camp Wickoff in 1898 without any evidence of having received medical care during their voyage from Cuba. The army ration in those days was provided by practical men who supplied the canned goods, which acted as acute intestinal irritants, instead of a successfully adapted nutriment. Typhoid infection reached such a grade of virulence as to prove fatal in from seven to ten days, with enormous lymphoid hyperplasia resembling leukemia, and practically every line soldier who landed on Long Island from Cuba was infected with malaria or dysentery or both.

Shortly afterward the Japanese conducted a much more extensive warfare with the aid of medical science, and with nearly complete elimination of infectious disease as a cause of death. During the present world conflict medical control held the incidence of communicable disease to its normal ratio, until apparently in recent months, when the cumulative effects of undernutrition and defective hygiene, among both armies and civilian population, have permitted unusual ravages by our old enemy the "white plague," and given an unexpected opportunity immediately embraced by the pestilential smallpox. A highly significant demonstration is now being given in Europe of the decisive effect of predisposing causes in the development of infectious diseases. We have always known that undernutrition favored tuberculosis, but there has never before been such overwhelming proof as is now furnished by the increase of tuberculosis in France and Germany. For us the lesson to be drawn is the prime importance of nutrition as a preventive of disease. Already there have been outbreaks of measles and meningitis among congregations of enlisted men in this country. The seeds of poliomyelitis so widely sown last summer may find conditions favorable for an even more extensive epidemic in our camps, unless it is rigidly guarded against, or unless, as seems more likely, age is the decisive immunity factor.

Thus, it is almost a truism that medical science, in its control of preventive medicine and sanitation, makes modern war possible. Here, I venture to point out that our progress in this war will depend more on the success with which the medical department applies the rules of prevention, sanitation and nutrition, established in the laboratory by laboratory men, than on the cure of established disease. Thousands of trained physicians will treat the sick and care for the wounded, but there will be more responsible duties in applying the rules of sanitation and preventive medicine.

Suddenly, without warning, we are to be tested on the basis of the grade of knowledge the American medical profession now possesses in the field of preventive medicine and hygiene. It is too late to make good existing deficiencies. We must stand on past records and existing conditions.

Thus, war, applying a rigid standard of utility, places first emphasis on a department of medical science which is commonly regarded as most theoretical. It is also one which is among the least prominent in present schemes of medical education, and I take this opportunity of urging that greater prominence be given to this subject by the Council on Medical Education in this Association. There are good departments of public health and hygiene in several American medical schools but not in many, and there is one special hygienic institution projected; but the rank and file of the American medical profession is poorly trained in this field. Fortunately there are indications, in the wide experience and brilliant achievements in Cuba, Panama and the Philippines, and in the high standing of our hygienists, that American sanitary science will successfully meet the new demands thrust on it.

Another influence of war on American medicine, already in effect, has been the enforced development

* Chairman's address, read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

of scientific medical literature. Prior to 1914, Germany held a monopoly of medical publication, both of results of research from all parts of the world and of the fruits of discussion and speculation. The sudden closing of this outlet has thrown on America the task of providing the medium of scientific discussions in many departments of medicine. Several new journals have already appeared, all of them of high grade, most of them from laboratory circles. Great importance for American medicine attaches to this movement. I venture to think that the conciseness and perspicacity which ought to characterize American literary productions offer advantages over some of the European standards which have thus far prevailed. Writing makes an exact man and reading a broad man, and the existence of abundant literary channels cannot fail to strengthen American medicine in two directions in which it is, perhaps, least proficient.

Educational facilities in America have made rapid development during the past decade, but the devastating catastrophe that has overtaken Europe throws on America a new responsibility as well as an opportunity to provide on a larger scale for both postgraduate and undergraduate medical training. Already there has been an influx of foreign students of medicine, and in order to meet their requirements and maintain ourselves as competent leaders and teachers, there is a call for more modern, more elastic, and better organized institutions in all departments of medicine, especially in the fundamental medical sciences.

If these demands are to be met there must be firm resistance against any temptation to suspend scientific activities in the universities because of the demands of the war. It is to be hoped that the sources of voluntary support on which our research and educational institutions largely depend may not be taxed out of existence, or crippled in capacity, or estranged, by unwise legislation. A portion of the vast increase of the wealth of the country should in some way be made available in the support of medical science. An early end of the war is to be hoped for, so that the increased wealth may not be dissipated by a continuation of the enormous military outlay now in preparation. There can be little doubt that the exhaustion of resources in Europe will entail a period of lean years for many of the interests of science. We may not again make our wonted visits to the highly respected centers of medical learning in Europe with the same subservience as in former times. Moreover, it must be admitted, with regret, that somewhat different standards will in future be employed in estimating the relative value of foreign and domestic training in medicine. Americans have fully acknowledged and liquidated their debt to European medical science; in the minds of some they have overvalued it; but now the times have changed, and we shall repel the enemy whether he come in the form of a military invasion, or as a more subtle undemocratic and materialistic philosophy, or as autocratic and overadvertised science.

In the new era thus opened in American medicine, and accelerated by war conditions, the necessity of establishing the strictest standards of intrinsic worth and utility necessitated by war conditions will assure that physiology and pathology exert a commanding influence, for these are the central medical sciences beyond the established boundaries of which medical activities proceed at their peril. In educational schemes, these fundamental branches must be inculcated in their fullest scope, so that every graduate in medicine shall acquire a sound physiologic and pathologic common sense.

In the conduct of research, a knowledge of physiology and pathology must be regarded as an essential qualification, if research is to be genuine and medicine is to make real progress. Otherwise practical medicine will have blind leaders, will be swayed by every wind of doctrine, and will be caught in the eddies of incompetent speculation.

Finally, in the distribution of material resources and moral support, physiology and pathology must receive a liberal share, for these sciences are not self-supporting; they do not appeal to the untrained or the practical man; they owe their existence to design on the part of the intellectual leaders of medicine, and their vitality in any land is a measure of the loyalty which physicians hold to their profession.

The history of American medicine, especially its progress during the past decade, is the sound assurance that the future support of these fundamental branches of science will be adequate.

477 First Avenue.

Medicine in China.—The backwardness of medicine in China at present, according to Dr. Wu Lien Teh (*Survey*, Jan. 6, 1917), is due to theories, based on an incomplete knowledge of anatomy and physiology, which have prevailed among all classes for over 3,000 years. The ancient Chinese, however, he says, were far ahead of their times, and taught and practiced inoculation for smalipox; medical statistics were published by the government during the Chou Dynasty, 600 years before Hippocrates; medical men were required to pass a state examination before being allowed to practice; isolation of cases of infectious diseases was practiced; intracranial surgery was known; a national pharmacopeia, handed down for nearly twenty centuries, included such drugs as mercury, arsenic, iron, sulphur, camphor, aconite, castor oil and digitalis, and organotherapy was practiced. The science of hygiene was known, and though modern sanitation is rarely seen in Chinese cities, it is said that a certain system of personal hygiene is practiced. Su Wen Ling Ch'u in his book, 2,600 years ago, defined hygiene as health preservation in order that life may be lived to an old age, and advised "restraint in all appetites, and cleanliness in house and person."

Chou Kung (1105 B. C.), brother and adviser of the first emperor of the great Chou Dynasty, recognized the value of medical statistics, as he showed by giving the following advice:

> In every country there are sick as well as healthy people. When treating the former they should be separated into those suffering from internal and those suffering from external complaints (that is, medical and surgical cases), and careful notes kept. At the end of the year these notes should be arranged and the records tabulated. From information thus obtained, rules regarding treatment and dieting may be revised, and, wherever possible, adopted. If, after this, future statistics show that out of ten patients treated all get well, every satisfaction may be felt. If, however, only one out of ten dies, the results may be regarded as good; if two out of ten die, the results are only fair; if three out of ten die, they are poor, if four out of ten die, they are bad.

The relation of diet to health was also recognized, and food was rarely eaten uncooked. Regarding diet Chou Kung says:

> In spring eat more sour stuff; in summer, try more bitter things; in autumn, cook more hot dishes, and in winter, consume more salt food.

GUNSHOT FRACTURES OF THE SHAFT OF THE HUMERUS*

JOSEPH RILUS EASTMAN, M.D.
INDIANAPOLIS

Since nearly every case of gunshot fracture of the bones of the extremities is compound and infected, there arises in practically every instance the important question whether or not one should strive in the presence of infection, perhaps taking the form of active phlegmon, to secure coaptation and provide extension.

Four measures, as stated by Rydigier von Ruediger, are of indisputable value: (1) reposition, brought about in the most gentle and cautious manner; (2) the most precise and uninterrupted immobilization not disturbed during the change of dressings; (3) a supportive apparatus, allowing free access to the wound; (4) a supportive apparatus, the making and use of which requires the least technical skill and experience.

It is established that many gunshot wounds of the soft parts, even in soldiers coming from the necessarily insanitary trenches, heal by first intention, as Simon and Pirogoff have stated. In the case of gunshot wounds of osseous tissue, however, a stage of infection with suppuration, while not fairly to be recognized as an obligate stadium, as Strohmeyer contends, is certainly present in an overwhelming majority of instances. For example, in our gunshot fracture material in Reserve Hospital No. 8, Vienna, embracing more than 500 cases, we have operated in less than a dozen which healed by first intention.

In gunshot fractures of the humerus with active infection and with extensive swelling and great tenderness, the obstacles in the way of securing good immobilization and extension are sometimes insurmountable, so that the surgeon must be content first to treat the infection without regard for the unfavorable position of the fragments. Nearly always, however, immobilization is possible, and likewise extension may be provided, even if it be in so simple a form as gravity extension brought about by the downward pull of the heavy swollen member lying on a simple internal splint.

Fig. 1.—Middeldorpf triangle abduction with extension by gravity.

Fig. 2.—Hoffmann splint abduction with slight gravity extension.

Von Eiselsberg, Rydigier, von Haberer, Burian and many others have spoken of the desirability and need of greater attention to the position of bone fragments in the presence of infection. Perthes,[1] on the other hand, in speaking of badly infected femur fractures, advises against measures aimed at reposition until acute infection has subsided. This, however, as Rydigier observes, should apply only to radical or forcible means to secure coaptation and extension. There is little or no difference of opinion as to the advisability of providing rest and extension, if thereby nothing is done which interferes with the proper treatment of the phlegmon.

In the correct position of the bone fragments, drainage is better than when the bone ends lie in abnormal relation in lacerated muscle tissue (Rydigier), and the reposition of fragments is easier before extensive scar formation has shortened and hardened the soft parts.

In a large number of gunshot humerus fractures it has seemed inadvisable because of severe pain and swelling to apply any extension device which could in any way cause circular constriction of the arm. Thus, weights hanging by bandages from the flexure of the elbow or any extension apparatus causing pressure over the infected swollen area or near it were, as is perhaps quite obvious, found to be impracticable.

The weight of the dependent heavy swollen arm itself often operates to excellent advantage in securing a moderate degree of extension. With the added weight of a plaster cast, a Toepfer or Kramer woven-wire splint or the much superior open heavy wire splint of Thomas, Eiselsberg or Englemann, the last three allowing free access to the wound, there develops traction from the gravity pull alone.

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Perthes: München. med. Wchnschr., 1915, p. 756.

In the use of the Middeldorpf triangle (Fig. 1), an excellent splint is provided for the support of the humerus fragments and for their retention in alignment, while the weight of the swollen arm furnishes some downward traction.

Fig. 3.—Modification of Hoffmann splint. Ratchet device regulates abduction and degree of gravity extension.

While the abducting splint of Hoffmann (Fig. 2) and its various modifications (Fig. 3) provide comfortable support for the fractured arm, they do not allow of gravity extension, as does the Middeldorpf triangle (Fig. 1).

Fig. 4.—Thomas wire splint.

Splints like that of Hoffmann, which hold the humerus in abduction at or near a right angle with the spine, are of greatest service in the case of gunshot fractures of the upper end of the humerus shaft, owing to the possibility of stiffness or ankylosis of the shoulder joint. In such a case the upper arm is with prudence fixed in marked abduction for the reason that should stiffness or ankylosis supervene, the mobility of the entire upper extremity will be dependent on the mobility of the scapula alone, and the arc of mobility of the ankylosed shoulder is greatest if the fixation has occurred with the humerus in abduction so that when the arm hangs at the side, the tip of the scapula approaches as nearly the midline of the back as possible (Wullstein-Wilms).

In gunshot fractures of the upper humerus without great swelling of the soft parts, strong traction may be secured by using the wire splint of Thomas (Figs. 4 and 5) or my wooden modifications of it (Figs. 6 and 7). Here extension is maintained by a broad bandage or cravat across the upper forearm at the flexure of the elbow, and counterextension is provided by the axillary part of the splint. Elastic pull is furnished by a rubber band or spiral spring interposed in the cravat at its attachment below.

In fractures with wounds on the inner side of the arm, the device of Burian shown in Figure 8 may be utilized for immobilization and extension. Two cravats, one in the axilla and the other at the elbow, both attached to cords passing over pulleys, receive elastic traction from a spiral spring at the back of the splint.

More important than any splint or cast for the treatment of gunshot fractures of the humerus is the principle that each case requires individual consideration—that no one device is suitable for all cases. For

Fig. 5.—Thomas wire splint. Extension by elastic traction at flexure of elbow.

example, in fractures suitable for the Hoffmann splint, it may be impossible to immobilize the arm with comfort in abduction at right angles to the spine, in which instance resort may be had to a simple modification of the Hoffmann splint shown in Figure 3 which allows any degree of abduction. The post supporting the upper arm-rest moves on a ratchet on the base lying against the thorax. Thus, the degree of abduction may be changed at will without disturbance of the dressings.

Not many patients with gunshot fractures of the upper arm will find adhesive plaster or masteol[2] and weight extension comfortable, owing to the tenderness and pain of the infection. To most of the soldiers thus wounded, we have found such extension methods intolerable. In a few instances in which swelling and tenderness were not marked, mastesol extension has been well borne, especially when the extension was combined with rest in bed. In general, however, it

2. Masteol is a glue made of alcohol, benzin, Venice turpentine and resin with which flannel straps are attached to the extremity.

may be said that a traction splint like the wire splint of Thomas, permitting, as it does, traction on all fragments in all directions and allowing free access to wounds wherever situated and not confining the patient to bed, is greatly superior to adhesive strap extension.

In treating the infection of gunshot humerus fractures, in addition to immobilization, removal of infected bits of clothing, incision and drainage, it will not infrequently be desirable to employ hot, wet antiseptic dressings. The Thomas splint permits the application of hot fomentations to any part of the arm.

For the hot, wet dressings, Dakin's neutral solution of chlorinated soda has proved of great merit. It is cheap, a very important matter in war surgery, and is highly bactericidal. Bedridden humerus fracture cases, that is, those with extensive infections, may be treated by continuous through and through irrigation, as are the infections of the lower extremity. Thus, in deep and extensive infections of the arm, a rubber tube is inserted to the bottom of the wound or entirely through

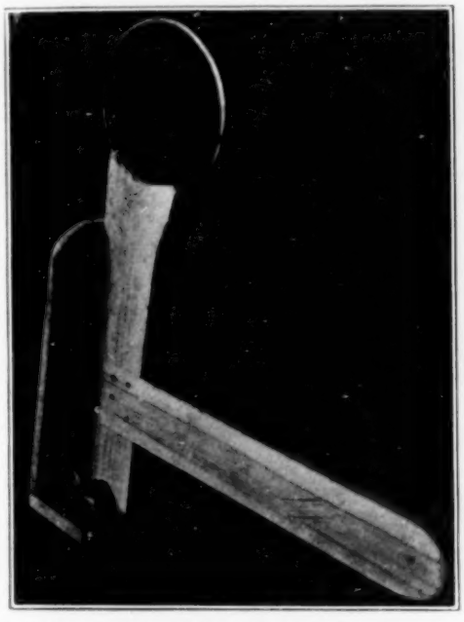

Fig. 6.—Author's wooden splint, light in weight but not serviceable if wound is on inner aspect of arm.

the member, and the solution is allowed to flow into or through the wound by the drop method, as suggested by Carrel. Excellent results have been attained in fractures of the lower end of the humerus with shattering of the elbow by placing the arm in a continuous hot bath of neutral solution of chlorinated soda.

Solution of aluminum acetate (Burow's solution) is likewise popular in Austria for the continuous bath in infections.

Ambulant patients have large hot, wet dressings of neutral solution of chlorinated soda applied around the drainage tube and over the open wound. The dressings are changed at frequent intervals.

The open method of treating fracture wounds recommended by Braun, Loercher and Walzel has proved to be a valuable resource, obviating, as it does, the frequent painful changing of dressings with destruction of granulations, and minimizing foreign body reaction. In favorable weather, infected gunshot fractures, like all other infected wounds, were exposed to the sun's rays for several hours daily. The solar rays without doubt hastened the drying up of secretions and stimulated epithelial growth in many cases. Pyogenic bacteria and contaminating saprophytes succumbed rapidly in the sun.

Fig. 7.—Wood modification of Thomas splint.

With subsidence of infection after all signs of inflammation have passed, gunshot fractures of the humerus may be treated safely by the more forcible methods of extension, for example, with the bridged plaster-of-Paris cast of Rydigier, in which two segments of plaster, the one encasing the shoulder, the other the elbow, are held apart by an iron brace. The iron bridge is bent at right angles above and below, and the ends are incorporated in the two plaster segments. A screw like that used to render wire taut is set in the brace, and extension is developed by forcible separation of the two segments of plaster cast. Obviously, forcible extension may also be secured with the Thomas wire splint or any one of its modifications.

Fig. 8.—Burian pulley splint.

Unfortunately, shortening of the soft parts and scar formation as well as callus militate strongly against the success of extension methods if these are not applied early; hence the reasonableness of beginning extension as early as possible in all infected gunshot fractures of long bones.

In those cases of severe infection demanding postponement of all efforts to correct deformity until fixation of the fragments in faulty position has become so firm as to exclude extension treatment, resort must be

had to open operation as the only means of restoring normal anatomic relations and functions. The Lane plate, wiring, bone peg and dowel graft methods are all useful in appropriate cases. We have used the

Fig. 9.—Bridged splint. The weight of such a splint applied to upper arm gives considerable gravity extension.

Lane plate in cases in which the tendency to angulation was such that it was feared the dowel graft or intramedullary bone peg might break. Wiring was employed in long oblique fractures, and intramedullary autogenous bone grafts were used in all cases in which the shape and position of the fragments were such as to

Fig. 10.—Method of splinting with plaster in badly comminuted humerus fractures.

admit of their use, that is, when the medullary canal was well preserved in the ends of both fragments. Intramedullary grafts were preferred to dowel grafts because of the greater strength of the former.

The Lane plate was used, for example, to unite the pointed ends of fragments which it would have been difficult to unite directly by bone grafting. An advantage of the Lane plate is based on the circumstance that apparently cured infections often reappear after bone plastic operations. The reawakening of dormant infection is a recognized and not infrequent sequel of operation in gunshot fractures. The Lane plate, if it must be removed because of the reappearance of infection, can be taken out easily, certainly much more easily than an intramedullary bone peg.

In view of the fact, noted by all surgeons of experience in the operative treatment of gunshot fractures, that infections apparently entirely healed for many weeks will reappear as the result of trauma, hemorrhage, etc., incident to operation, no open operation for the correction of deformity due to gunshot fracture should be undertaken until several months have elapsed after the disappearance of every sign of infection.

As an evidence of the respect in which the Austrian surgeons hold this late infection or their dread of it,

Fig. 11.—Swelling accompanying infected humerus fracture contraindicating use of encircling bandages for traction.

mention may be made of a proposal of Finsterer, made to the Vienna Society of Military Surgeons, that after healing of infected fractures with bad deformity, no attempt should be made in many instances to operate at the site of fracture but as remote from it as possible. For example, after healing of an infected fracture of the upper third of the femur or humerus with decided angulation, the bone should be divided at a lower level, compensation made for the angulation above, and the bone elongated as tendons are lengthened by splitting the bone longitudinally with a circular motor saw and cutting out laterally above to the right and below to the left, sliding the sawed surfaces along each other until the proper degree of elongation is secured (Fig. 13).

ABSTRACT OF DISCUSSION

Dr. Leonard Freeman, Denver: Dr. Eastman, I think, deserves our utmost commendation for bringing this subject before us, because, although we are at war with Germany, we are very glad to know what Germany is doing scientifi-

cally in the treatment of wounds. Dr. Eastman has particularly emphasized the use of the Steinmann pins or nails, which are driven through the lower end of the femur, the upper end of the tibia, or the os calcis, for making extension in fractures. I think attention should be called to another method of making extension in a similar way, because the pins driven through the bones are apt, in the course of time, to cause necrosis. The same thing can be done by silver wire looped around the upper part of the os calcis, between the Achilles tendon and the tibia, without penetrating the bone. For this purpose is needed a long needle fixed in a handle, with an eye near the point. The needle is first plunged directly through, above the os calcis, between the Achilles tendon and the tibia, and the wire is threaded into its eye and pulled through. Then, facing the bottom of the foot, the needle is plunged upward through the tissues of the bottom of the heel along either side, and out of the skin-openings through which the wire passes, and the ends of the wire threaded into the needle and drawn out through the bottom of the heel, so that in the end we have the wire slung around the os calcis, with its long ends projecting through the skin of the heel. The advantages of this procedure lie in this: it is simple, it keeps the foot up straight, the bone is not injured and there is no pressure of the wires on the skin of the sides of the foot; in fact, there is no pressure on the soft parts at all. If, every two or three days, the small perforations where the wires come out are painted with 2 per cent. iodin, there will be no infection about the wounds, as I have repeatedly proved to my satisfaction.

Fig. 12.—Continuous irrigation with neutral solution of chlorinated soda in infected humerus fracture.

DR. BERNARD H. OBEREMBT, Milwaukee, Wis.: I had both the pleasure and privilege of being with Dr. Eastman in Austria and I would like to confirm all he has said. One of the important things is splinting the fractures for transportation. In every case, when properly splinted, the infections when they came to the base hospital were not so severe, while patients with badly splinted fractures suffered severely in transport, their phlegmon was much greater, their constitutional symptoms were a great deal worse and their treatment was necessarily a great deal more severe; so we cannot urge too strongly on all our men at the front that they should properly and thoroughly immobilize every fracture that is sent back. The best splint was, for femur fractures, the Hey-Grove splint. It is cheap to make, easily made, it gives extension continuously, even while the patient is being moved, and the wound is accessible at all times for thorough and easy dressing.

Fig. 13. — Finsterer's method of restoring length of shortened humerus, advocated by him because of the danger of reawakening infection by operation at site of fracture.

As to the treatment of these infected, comminuted fractures, Dakin's solution (neutral solution of chlorinated soda, Carrel-Dakin) was used in more than 3,000 cases in our institution, with very gratifying results. Every one of us could speak highly for the use of it. The idea expressed by a lot of men that all that is necessary to clean up these wounds is Dakin's solution, will only put Dakin's solution in disgrace if we continue to believe that. Most of these cases clean up so rapidly that one can suture in eight or ten days. Practically all these cases are of low grade infection. When it is gas bacillus infection, or streptococcus infection, large incisions and perfect drainage are required. In all infected wounds it is essential to remove every bullet or shrapnel and all pulverized bone and the bone splinters which have become detached from their periosteum. They are all foreign bodies and must be removed to give the Dakin solution a fair chance. We used many other methods and continue to use them. Both the aluminum acetate and Dakin's solution give excellent results, especially in the continuous bath. In some of the cases in which Dakin's solution did not prove as efficient as we hoped, we changed to the aluminum acetate with better results. On the other hand, when they did not do well on the aluminum acetate we

Fig. 14.—Open air and sun treatment of infected fractures in garden at Reserve Hospital No. 8, Vienna.

changed to the Dakin solution, often with improvement. So it is well that every man should thoroughly understand the use of Dakin's solution. The solution itself constitutes the smaller proportion of the cure, but its use, and how to use it and to use it properly, acquire a good result, in other words, the mechanical treatment of infected wounds in the Carrel-Dakin method is 80 per cent. of the cure.

Dr. Frank P. Corrigan, Cleveland: Going back beyond consideration of the ultimate treatment of these cases and in line with Dr. Oberembt's remarks about early care, immediately after the casualty occurs, I have a suggestion to offer for the transport of these cases. This consists of an extensible frame and compressing sleeve woven so that it contracts and expands. This could be employed by any one immediately after the casualty occurs. It has the merit of applying even compression to the limb, and so controlling hemorrhage. It gives extension and counter extension. In connection there is a clamp that fits over the stretcher rod which gives rigidity.

CONSIDERATIONS ON EPIDERMOLYSIS BULLOSA *

AUGUSTUS RAVOGLI, M.D.
CINCINNATI

The case of epidermolysis bullosa under consideration was one of a very severe type, which was reported by Nelson[1] in 1916. The condition of the patient was constantly growing worse, and the parents, who were wage earners, being unable to care for the patient, he was taken to the Cincinnati General Hospital, and placed in my service in the dermatologic department. It will be helpful to review the history of the patient as given by Dr. Nelson.

REPORT OF CASE

E. P., boy, aged 11 years, of Cuban parentage, was born in Tampa, Fla. The father and the mother are both in good health. They assert that they have never had any eruptions on the skin, but the paternal grandfather had "running sores," due to some bad disease.

The patient was the fifth child in the family. He was normal and fairly developed at birth. The mother recently has had some miscarriages. When the patient was born, the mother could not nurse the babe, and a wetnurse was employed. The parents say that this nurse had some eruption of the skin. When the babe was 9 days old, eruptions of small bullae appeared on different parts of the body and head. Since then bullae have developed on the body continuously with the exception of the scalp. The parents report that the eruption is worse in summer. Every little injury to the skin becomes the seat of the bulla. Within half an hour from the injury, the skin turns red and bullae soon appear. They are at times formed in the place in which others were healing up. The blebs usually contain straw-colored serum, but many bullae contain blood-stained serum. Some of the blebs burst and the raw surface heals up in a few days, while in other instances the blebs remain intact, the serum is reabsorbed, and the epidermis is cast off in the form of thick scales. Slight itching precedes the development of the bulla. In five or six days the lesions become healed, leaving a brownish pigmentation with a rough, scaly epidermis.

It is interesting to note the complete absence of the nails of the fingers and toes. The parents report that the nails were present at the birth of the child, but that when he was 1 year old they disappeared. While in the hospital service, the boy fell off the bed, causing a cutaneous wound on the forehead which required a few stitches. No bullae appeared around the wound or on the bruised skin.

With the exception of the bullous eruption, the general health of the boy has been good. At the age of 5 years he had measles. He is rather undersized for his age. He has a full growth of dark hair on the scalp. The iris is dark brown. Teeth are not normal, being large, somewhat rough at the gums, and with faulty implantation. His mentality is fair; he goes to the school in the hospital, is rather bright and learns easily. An inspection of the body shows nearly the entire cutaneous surface stained with irregular pigmentation of a marbled appearance, with some whitish patches intermingled, the result of superficial cicatricial areas. The parts which have been chiefly affected are the extremities, which are more exposed to trauma. The whole surface of the elbows are reddish violaceous, covered with shreds of dried epidermis which formed the bullae, and small bullae are found in clusters in this region. The forearms show also some pigmented spots mingled with whitish cicatricial tissue marking the location of former bullae. The hands and fingers are considerably deformed; the same reddish violaceous color noted on the elbows is seen on the whole hand. Shreds of epidermis yet hanging indicate that the bullae were located mostly in the palms. The fingers are deformed, thick, red, and covered with scales and kept in semiflexion. The fingers have no nails; all traces of the matrix unguis are entirely absent, being replaced by thick whitish skin.

The skin of the back and of the gluteal region is in the same dark pigmented condition, with recurrent bullae, especially where the trousers press against the skin. In the lumbar and femoral regions, bullae, some of which are 2½ inches in length, are to be observed. They are narrow in a transverse direction, representing the string which held up the trousers. The knees are brownish-red with cicatricial areas to which hang epidermic scales, and with some crusts covering the broken bullae. The legs, bluish red, are darkly pigmented, intermingled with thin superficial areas of cicatrix. Ulcerated places are scattered in an irregular disposition.

The feet, red-bluish, are covered with shreds of epidermis, which formed the vaults of the bullae. Epidermic scales are more abundant on the soles. The toes have no nails; on the ungual region of the second toe of the right foot a bulla can be seen, round and filled with bloody serum, which happened there when the picture was taken. The epidermis of the whole part is thick with dark pigmentation, scaly, wrinkled, hard and inelastic, yet the boy is able to walk and play without much discomfort.

The bullae are formed in a short time in the areas of the skin exposed to trauma or to irritation. The feet are often covered with bullae on the surfaces where the slippers were tied. Some of the bullae, as stated, contained a light straw-colored serum, others bloody serum. Probably the difference in the fluid forming the bulla depends on the result of the intensity of the traumatism. In general, the boy is healthy; during the last months that he was in the hospital he had a good appetite, receiving an unrestricted diet, and all his functions were regular. The urine was normal, no indican, and the blood count revealed nothing abnormal. The Wassermann test, which Dr. Nelson[1] found negative, was likewise confirmed in the hospital laboratory.

COMMENT

The most interesting points in the case are the formation of bullae, which began to appear a few days after birth, on any part exposed to traumatism or irritation, marked infiltration and discoloration after the lesions had subsided, the bullae showing some tendency to a concentrical disposition, and the total absence of the nails.

This case, however, is in contrast with the case of epidermolysis bullosa reported by Wende, in which there was complete lack of hair of the scalp, eyebrows and eyelashes. The nails in our case had completely disappeared, and were replaced by a smooth epidermis. In the case of Wende some residual distorted nails could yet be seen. Similarly, in the illustration of a

* Read before the Section on Dermatology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Nelson, A. W.: Epidermolysis Bullosa, Urolog. and Cutan. Rev., 1916, **20**, 378.

case by Heller[2] the matrix unguis has yet some rudiments of an atrophic nail.

CAUSATION

Every disease should be studied from its etiologic side; when the producing agent has been ascertained, the prevention and treatment can be determined. The finding of toxic products as a result of the metabolic process in the system has afforded an explanation of several affections of obscure origin. These toxic elements accumulate in the system either from lack of excretion, or from a superabundance of their production. These substances may be the result of normal changes in the tissue functions or of an atypical decomposition of the albumin. Abnormal conditions of digestion in the intestinal tract often produce toxic elements which, when brought into the circulation, become the cause of different skin eruptions. Some of these eruptions are associated with acute disorders of the stomach and intestine, as urticaria, eczema and pruritus, while others are the production of chronic disturbances, as several forms of acne. Epidermolysis bullosa (so called) hereditaria, a stubborn and rebellious affection, has been referred also to autotoxic dermatoses, on purely speculative views.

By an increased irritation on the skin, exudation can be produced in the urticarial wheals, with the detachment of the epidermis forming bullae. In the delicate skin of children this condition often occurs; it is not only caused by a possible internal disturbance, but is also observed following bites of the mosquito or the *Cimex lectularius*.

The theory of autotoxic substances explains diseases of unknown etiology, such as dermatitis herpetiformis. Epidermolysis bullosa could be regarded as a hereditary liability of the skin to respond to any irritation, the formation of the bulla being the result of a lymph stasis,[3] the compression of the shoes, the irritation from any injury causing the effusion and the accumulation of serum under the epidermis.

Fig. 1.—Epidermolysis bullosa. *A*, absence of finger nails; epidermic shreds from bullae.

On the other hand, we cannot overlook the influence of the disturbances of the circulation on the production of skin eruptions. The congestion of blood in the blood vessels may be the result of the irritation exercising spastic control, or of the paretic condition of the nerves regulating the circulation, the vasomotor nerves. If the nerve is degenerated, the inactivity of the blood vessels will be permanent, while poisonous elements acting on the dilatatory nerves produce an effect which is only temporary.

There would appear to be in these cases a common origin, which produces lesions of different appearance, but in substance the same. It is for this reason that we find points of analogy between dermatitis herpetiformis, urticaria pigmentosa, epidermolysis bullosa, and even purpura and pemphigus. Manifestations of an inflammatory nature, depending on toxic agents, affect the vascular apparatus in a different degree, according to the individual susceptibility. George Henry Fox,[4] in 1883, pointed out the exciting causes of urticaria, consisting in certain forms of irritation of the terminal nerves acting within or without the body. He demonstrated a definite relation of the irritation to the eruption as evident as the cause to the effect.

Manifestations of a vasomotor nature from paralysis of these nerves is chiefly revealed by the impairment of the functions of the nerve constrictors. These alterations are permanent when caused by a divided or a degenerated nerve, but are only temporary when of poisonous origin. The recurrence of the symptoms and their obstinacy are often the clinical signs of a maintained irritation on the nervous area. The blood vessels, as the result of protracted constriction, suffer in their histologic structure, showing a condition similar to that found in arteritis and sclerosis, and the results, asphyxia and gangrene, are nearly identical. The enlargement of the blood vessels, passive stasis, is in many cases a collateral one consequent to the constriction — or can it be the result of an irritation on the vasodilator nerves? All contractions of

2. Heller, Julius: Nagelkrankheiten: Handbuch der Hautkrankheiten Mracek, 1909, **4**, 600.

3. As shown experimentally by Weidenfeld: Zur Physiologie der Blasenbildung, Arch. f. Dermat. u. Syph., **52**, 3.

4. Fox, G. H.: The Etiology of Urticaria, Jour. Cutan. and Ven. Dis., January, 1883, **1**, 108.

muscle tissue follow the action of the nerves which regulate their functions. The irritation of the vasomotor nerves can act on their peripheral ramifications, or reach the vasomotor center in the medulla oblongata; there is also a system of individual centers in the spine. For this reason, irritations on the system of vasomotor nerves may come from the brain, from the heart, from the skin, and from the blood vessels themselves. From the cutaneous surface, impressions of a sensitive nature may be carried to the center and produce muscular contraction.

In this case it will be interesting to consider the action of the trisplanchnic which, by causing constriction and hyperemia in the abdominal organs, throws a surplus of blood into the capillaries of the skin. In the case under discussion, the congestion of the cutaneous blood vessels has to be considered as of a passive rather than of an active type. Pinkus[5] referred to the irritation of the vasomotor nerves in causing the contraction of the arteries which is to be observed in some neuritic cutaneous affections, and in all eruptive manifestations, which often accompany nervous diseases.

The terminal ends of the sensitive nerve fibers when under an irritation have great influence on the vasomotor system. The results of the irritation are readily seen at the point of application in the form of hyperemia, edema and urticaria. In these cases the irritation may not be transmitted through the center to the motor nerves, but there is a short system of communication between the last sensitive fibers and the motor fibers which causes the eruption to remain local. The irritations through the sensitive nerves reaching the center have great influence on the blood pressure through an increased heart action. When the veins have difficulty to return the blood to the center, cyanosis and hemorrhages take place. In other instances we see erythromelia (Pick), glossy skin (Weir Mitchell), and livid or marmorated skin. In cases of paralysis of the secretory nerves in the affected region, diminution of perspiration is found. Those nervous manifestations show the beginning of functional neuroses, which are not our present object of study.

In this case we observe irritation on the surface of the skin, the sensitive end-fibers of the nerves bring the impression to the peripheral centers of the vasomotor nerves, at which point it is converted into a spastic contraction of the small arteries. The spasm is soon followed by relaxation, the vessels are dilated and the blood fills them, thus causing congestion. From the filled blood vessels an exudation of serum takes place, which in urticaria forms an edematous condition of the skin, or when in larger quantity forms bullae as in epidermolysis bullosa.

PATHOLOGY

Biopsy has revealed little of the intimate pathologic process of the disease. The first studies of Goldscheider, Elliot,[6] Blumer, Colombini,[7] Wende[8] and others on epidermolysis bullosa hereditaria, and those of B. Ochs, Bukowski,[9] Fred Wise and Lautman on epidermolysis bullosa in an acquired form, all agree that the findings in the affected skin are those usually present in inflammatory exudative processes. The vesicles in their early formation are more or less deep in the malpighian layer. The cover of the bulla is made up of the stratum corneum, with part of the mucous layer more or less degenerated. The floor of the bulla is formed by the denuded papillary layer of the corium, the papilla being bare and distorted; serum fibrin and cells form the contents of the bulla.

Some edema and infiltration in the corium are present, revealed by a kind of vacuolization in the granular layer of the epidermis, and by the detached condition of the basal layer from the papillae. The capillary vessels are congested and somewhat dilated, surrounded by small infiltrating cells. The contents of some of the bullae were clear, others were yellowish, turbid, and others brown and bloody; they have also contained leukocytes, a few eosinophils, blood corpuscles and pigment granules.

The findings of Engman and Mook[10] differ from those of the other observers. According to their studies, the principal changes occur in the elastic tissue fibers, which they assert are absent or sparsely distributed in the papillary and subpapillary layers of the cutis. By the absence of the elastic fibers in the upper portion of the derma, they explain the histologic picture of the normal skin of these patients, and the clinical phenomena of the affection. On various occasions we have stated that the elastic fibers have a great influence in maintaining the fluids in the tissues at an even pressure, and also to control the growth of the collagenous tissues. This point of view affords a good explanation of the formation of the bulla. On the other hand, it is not easy to believe that the whole surface of the skin may be subject to such a histologic dystrophic condition. Moreover, most of the patients usually recover; hence it would be necessary to admit a new formation of the elastic fibers, which we know when once lost, are never reformed. The skin which has been the subject of repeated attacks of bullae has naturally undergone changes in its fine histologic structure, and the delicate elastic fibers may have been distracted, disturbed and atrophied; but we can hardly admit it to be the result of the exudation in the tissues of the derma.

SYPHILITIC HEREDITY

In my opinion the cause will be found in some disturbed condition of the vasomotor nerves, either from a somatic disorder in the meninges or in the connective tissues surrounding the vasomotor ganglions, and causing such irritability to react in the skin to each slight trauma. Some condition of irritability may find its origin in a toxic condition in the circulation from a disordered admixture of the internal secretions. Indeed, when the suprarenal glands are increased in their activity and the other glands are not able to counteract their action, general disturbances occur, which in the skin are revealed by increased pigmentation, discoloration due to the deposits of oxidized epinephrin in the tissues of the skin. I do not want to theorize on the possibilities of the origin of the disorders causing the irritability of the vasomotor system. Syphilis has been mentioned very little, but in those cases of epidermolysis bullosa associated with dystrophies, I cannot refrain from the idea that in those sufferers a syphilitic hereditary taint can be traced to either the parents or the grandparents. In many cases, hereditary or congenital syphilis is shown

5. Pinkus, F.: Allgemeine Pathologie der Circulationstörungen der Haut, Handbuch der Hautkrankheiten, F. Mracek, **1**, 349.
6. Elliot: Am. Jour. Cutan. and Gen.-Urin. Dis., 1895, **13**, 10.
7. Colombini: Monatsh. f. prakt. Dermat., 1900, **1**, 457.
8. Wende, G. W.: Jour. Cutan. and Gen.-Urin. Dis., 1902, **20**, 537.
9. Bukowski: Ein Beitrag zur Lehre von der sogenannten Epidermolysis bullosa hereditaria, Arch. f. Dermat. u. Syph., 1903, **67**, 163.
10. Engman and Mook: Interstate Med. Jour., July, 1910.

in the babe a few days after birth in the form of bullae on the feet and soles. This condition has received the name of hereditary bullous syphilid. Pemphigus neonatorum is nothing more than a syphilitic manifestation. Vesicular eruptions in clusters or small bullous eruptions are seen on the soles of the feet and palms of the hands in persons who have had syphilis, which had been forgotten because the Wassermann test had been negative. In case of syphilitic polyneuritis, through the courtesy of Dr. H. Hoppe, we have seen an eruption of large bullae affecting the soles of both feet, together with the nervous symptoms.

In our little patient there are present stigmata indicative of a syphilitic taint in spite of a negative Wassermann test. In the case of heredity it is possible that a few undeveloped spirochetes, in the form of spores, or encysted spirochetes not fully developed, contaminate the ovum. They lodge themselves in the developing blood vessels of the fetus, causing an alteration in the connective tissues surrounding the vasomotor center or the peripheral ganglions. This tardy specific inflammatory process may gradually subside, and the spirochetes may even be dead; but hardening or a sclerotic condition of the delicate tissues may remain, which acts as an irritation of the vasomotor ganglions, revealed by the formation of bullae on any irritation of the skin. This hypothesis has been suggested by the findings in the meninges in a postmortem of an old syphilitic, who had suffered for years with a stubborn case of parapsoriasis.

It can also be possible that through a hereditary taint an altered condition of the internal secretions is produced. The possibility that a few spirochetes have caused somatic alterations of the suprarenal glands with the results of an increased quantity of epinephrin in the blood which has brought a toxic influence on the vasomotor nerves is not entirely to be discarded. Neither can we exclude syphilitic affections of these glands, when we have cases reported and well demonstrated of syphilis of the thyroid and of the hypophysis. Thompson[11] reports a case of syphilitic involvement of the thyroid with severe symptoms of hyperthyroidism in an old man who denied all knowledge of venereal diseases but who evidenced a positive Wassermann reaction and made symptomatic recovery from mercurial and iodid treatment.

In regard to syphilitic affections of the hypophysis, Simmonds[12] referred to cases of diseases of this organ especially in congenital syphilis. They were carefully studied. The pathologic alterations consisted in miliary gummas, or in the new formation of plasma cells, and interstitial growth of connective tissues.

Fig. 2.—Epidermolysis bullosa. *A*, excoriations resulting from bullae; *B*, pigmented spots; *C*, superficial scar with epidermic shreds; *D*, absence of nail bullae on the second toe right.

Epidermolysis bullosa hereditaria exists, and in several instances cases of this disease have been reported occurring in several members of a family for the second and third generations. The cases of Bettman[13] and Valentine[14] are of the greatest interest, showing the disease reproduced in several members of the family to the third generation. Stelwagon and Gaskil,[15] Engman and Mook[16] and others have reported cases in which only one member of the family had shown this peculiar affection. In several cases under observation, my attention was not called to the existence of the same symptoms in other members of the family; they were isolated cases.

PROGNOSIS

If we study the patients with a common type of the disease, it will be observed that after many relapses they recover. The skin regains its tonus and the old bullae heal up easily, leaving little or no pigmentation, and finally disappear. In reference to epidermolysis bullosa hereditaria, or better, epidermolysis bullosa congenita of a dystrophic type, we have never had occasion to study the case for the patient's lifetime. In the case of Hallopeau,[17] which he considered as resulting from

11. Thompson, Lloyd: Syphilis of the Thyroid, Am. Jour. Syph., 1917, **1**, 179.

12. Simmonds, M.: Ueber syphilitische Erkrankungen der Hypophysis, Dermat. Wchnschr., 1914; Festschrift Zur Eröffnung des neuen Instituts für Schiffs- und Tropen-Krankheiten in Hamburg, p. 194.

13. Bettman: Dermat. Ztschr., 1903, **10**, 561.

14. Valentine: Zur Kasuistik der Epidermolysis bullosa hereditaria, Arch. f. Dermat. u. Syph., 1906, p. 87.

15. Stelwagon and Gaskil: Jour. Cutan. Dis., 1912, p. 428.

16. Engman and Mook: A Study of Some Cases of Epidermolysis Bullosa, with Remarks upon the Congenital Absence of Elastic Tissue, Jour. Cutan. Dis., February, 1906, p. 65; A Further Contribution to the Study of Elastic Tissue in Epidermolysis Bullosa, ibid., June, 1910, p. 275.

17. Hallopeau: Ann. de Dermat. et de Syph., 1898, **2**, 721.

trophic alterations, the patient continued to show bullae after any little trauma throughout life.

An interesting question arises whether or not the two forms have to be considered identical, and arising from the same causes. A patient referred by Vidal[18] manifested severe dystrophies of the nail, and atrophy and desquamation of the skin, bullae appearing only in the first months of life, chiefly on the hands and soles; later bullae ceased to gather.

The variability of the symptoms has been the cause of some difference in the nomenclature, so we find that Philippson[19] terms a case epidermolysis bullosa habitual, traumatic. Colcott, Fox and Bowen[20] reported cases as bullous dermatitis. Luithlen[21] considers many cases of this kind reported as pemphigus by Duhring, Roach, Brooke and Marshall to be epidermolysis bullosa. The case of Hebra, under the name of hereditary pemphigus, very likely was one of epidermolysis bullosa hereditaria, as several members of the same family had suffered the same bullous eruption.

This disease has to be entirely separated from pemphigus. It resembles pemphigus only in the formation of bullae, which are simply epiphenomena. Pemphigus is a generalized bullous eruption, with disturbance in the excretory function of the kidneys. In pemphigus the urine is of neutral reaction and under the microscope shows renal cells and casts. We can define pemphigus as a bullous eruption produced by the poisoning of the system from toxic elements not removed from the body by the filtering action of the kidneys. In epidermolysis bullosa, Nikolsky's sign, which is constantly found in true pemphigus, is not present.

TREATMENT

After our considerations of this obscure affection we have come to establish these etiologic factors: 1. Heredity in some cases. 2. A vulnerability of the skin. 3. Disturbed stability of the vasomotor system. All these systemic conditions must be recognized as having an origin or a focus of toxicity in the organism. On this theory we have established the treatment. The use of remedies vaguely and in a haphazard way, as Pollitzer[22] said, is less likely to lead to clear ideas, than an experience even based on a false theory. A working hypothesis, even if it is proved wrong, is more advantageous than no theory at all. Following my idea of a possible hereditary syphilitic taint, I have given in several cases of simple epidermolysis bullosa repeated small doses of calomel, and I was gratified to see satisfactory results. Of course, while one-sixth grain of calomel is being administered, with 1 or 2 grains of sodium bicarbonate, nothing interferes with the use of iron tonics to improve the general nutrition.

The patient in the case under discussion was treated with small doses of calomel, and with an iron tonic. His mouth unfortunately did not tolerate the calomel, and on account of the stomatitis we were compelled to discontinue its use. Yet we did not deviate from our first idea. Injections of neosalvarsan, 0.3 gm. each in oil, were administered in the gluteal muscle, once a week. From the first injection the bullae began to diminish in number and size. After the fourth injection few bullae were to be seen, and the boy had greatly improved in general nutrition and in the condition of the skin. He was discharged from the hospital service as well, and nothing further was heard from him.

It seems that the use of arsenic in the form of neosalvarsan has given the best results. Colombini praised the use of arsenic in increasing doses, together with iron tonics. In all cases of pemphigoid eruptions following vaccination in children, the best results have been obtained from the injections with solution of sodium cacodylate. In two cases a culture was taken and an autovaccine was prepared, of which injections were given every other day; no results could be observed.

From the therapeutic results it can be stated that in epidermolysis bullosa hereditaria or congenita, or in acquired form, the best remedies are mercurials and arsenicals. Whether they act on the system correcting the diathesic condition, or by preventing or opposing formation of toxic elements in the blood, or whether they influence the vasomotor nerves restoring their functional stability, or act on the somatic structure of the skin, diminishing its vulnerability, is not known to us. All that we can say is that by their use we have obtained good results.

ABSTRACT OF DISCUSSION

Dr. Harold N. Cole, Cleveland: I did not hear Dr. Ravogli speak of a lack of elastic fibers in the skin of these patients afflicted with epidermolysis bullosa. In my cases there was such a lack.

Dr. Charles J. Shepard, Columbus, Ohio: Two cases of epidermolysis bullosa have recently come under my observation. The first was in a student about 23 years of age, presenting small sized blebs as a result of traumatism, especially on hands and feet. He gave a history of having had lesions of various sizes earlier in life and always following a slight injury. His trouble began in early childhood, and preceding generations of the family showed the same condition.

The second case was in a young boy 10 years of age, the blebs following the slightest irritation and varying in size from 1 or 2 inches in diameter to the size of the palm. The skin showed pigmentation and atrophic changes. The hair was fine and thin. The nails on both hands and feet were shed and the fingers presented a webbed appearance. His general health was below par. No family history of a similar condition was obtained.

Dr. A. Ravogli, Cincinnati: After a slight injury, a knock or rubbing, the skin gets red, hyperemic; after five or six hours it is slightly edematous, swollen like an urticaria wheal, the epidermis is distended, and so a bulla is formed in a few hours. It is worthy of remark that once the boy fell out of bed, cut a big gash on his forehead and no bullous formation took place.

In reference to a certain similarity between dermatitis herpetiformis and epidermolysis bullosa hereditaria, it is undeniable. Both are obstinate, persistent, only the eruptions in dermitis herpetiformis occur mostly on the trunk, arms and thighs, without any injury of the skin, while in epidermolysis bullosa the bullae are formed after injury to the skin. Bullous eruptions of persistent nature follow vaccination. It seems that poisonous substances formed in the vaccine pustule, probably of streptococcic origin, infect the lymph spaces of the skin, reproducing inflammatory symptoms in the form of vesicles and bullae.

Cases of epidermolysis bullosa hereditaria, or acquired, after several years get well. Hallopeau, however, reported a case in which the formation of bullae lasted nearly all of the patient's life.

If lack of elastic fibers could be the cause of this hereditary condition, no improvement or recovery could be possible, because the elastic fibers once lost are not reformed. The

18. Vidal: Reunion hebdomadaire des médecins de l'Hôpital St. Louis, April 14, 1889.
19. Philippson, L.: Gior. ital. d. mal. ven., 1900, No. 5.
20. Bowen, J. T.: Jour. Cutan. and Gen.-Urin. Dis., 1898.
21. Luithlen, F.: Epidermolysis bullosa hereditaria, Handbuch. der Hautkrankheiten, Mracek, **1**, 753.
22. Pollitzer, S.: The Principles of the Treatment of Syphilis, Jour. Cutan. Dis., September, 1916.

disease disappears gradually, and consequently it cannot be due to a permanent dystrophic condition.

A young man who was employed in a dry goods store, every time he handled boxes, the following day had bullae on his hands and arms wherever the box had knocked the skin.

The internal administration of mercurials has given good results. In my case small calomel powders, one-sixth grain, once or twice a day in association with sodium bicarbonate, could not be continued on account of the sensitiveness of the patient's gums. Salvarsan, 0.3 gm., in oil in intramuscular injections gave good results. He was discharged from the hospital service. After fourteen days no bullae had reappeared.

THE PRODUCTION OF AN ANTIPOLIOMYELITIS SERUM IN HORSES

BY INOCULATIONS OF THE PLEOMORPHIC STREPTOCOCCUS FROM POLIOMYELITIS *

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It is a well established fact that the serum of patients and monkeys which have recovered from poliomyelitis has a neutralizing[1] and protective power[2] against the virus of poliomyelitis. Inoculations of virus as well as of cultures of the globoid organism[3] which fail to produce at least abortive attacks of poliomyelitis fail also to produce neutralizing and protective substances in the serum; hence immunity does not result. The recent work of Amoss[4] proves further that the globoid organisms of Flexner and Noguchi[5] have indeed little antigenic power. The need of immunization experiments along other lines in this disease is therefore apparent.

A restudy of the bacteriology of poliomyelitis during the past epidemic has emphasized anew the possible rôle which bacteria of ordinary size may play in the etiology of this disease. A pleomorphic streptococcus or micrococcus having elective affinity for the central nervous system in animals has been isolated quite constantly from the atrium of infection and the central nervous system,[6] the brain and cord[7] and the spinal fluid[8] in human poliomyelitis, and from the central nervous system of monkeys paralyzed with virus.[9]

It has been shown that under certain anaerobic conditions the organism may become exceedingly small, filterable and anaerobic, resembling very closely the globoid organisms of Flexner and Noguchi. Moreover, the mechanism by which the large forms become small has been demonstrated.[9] Injections of the large form of this organism into two monkeys soon after isolation has rendered the animals immune to virus,[10] a result not obtained with a streptococcus from another source.[11]

On the basis of these results, immunization experiments with aerobic cultures of the pleomorphic organism were instituted.

Recently Nuzum has reported on the protection of animals against the large form of the organism with the serum from a horse that had been injected repeatedly with aerobic cultures. Mathers and Tunnicliff[12] have shown a specific increased opsonic power of the serum toward this organism in poliomyelitis in children. Neustaedter and Banzhaf[13] appear to have developed a neutralizing serum in a horse by injecting large doses of filtrates of active virus.

I wish now to record the essential facts in the immunization of horses with cultures of the pleomorphic streptococcus, the results of experiments in neutralizing and protecting against virus with the immune serums thus obtained, and the findings of agglutination and complement-deviation studies.

IMMUNIZATION OF HORSES

The method followed for immunizing horses was that worked out by Flexner and Amoss[14] and Amoss and Wollstein[15] in the production of antidysentery and antimeningitis serum, respectively. Advantage was thus taken of the principle first noted by Fornet and Müller,[16] Bonhoff and Tsuzuki,[17] and Gay and his pupils,[18] of the very rapid production of antibodies following injections of antigen at brief intervals.

Increasing quantities of the pleomorphic streptococcus were injected intravenously for three consecutive days, this being followed by a rest period of seven days. A desensitizing dose of approximately one tenth of the immunizing dose was given on the first day of each period after the first. The immunizing dose of the first day of each period was that of the last previous injection. The dose on the second and third days of each series was increased approximately by one tenth. The temperature was used as a guide to dosage. If the temperature which rose soon after the injection had not returned to normal at the time for the next injection, the antigen was not given until it had returned to normal.

The bacteria for injection were grown aerobically in ascites-dextrose broth or dextrose broth in tall col-

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* From the Mayo Foundation.

* Read before the Section on Pathology and Physiology at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Levaditi, C., and Landsteiner: Recherches sur la paralysie infantile experimentale, Compt. rend. Acad. d. sc., 1910, **150**, 131.

2. Flexner, Simon, and Lewis, P. A.: Epidemic Poliomyelitis in Monkeys: The Activity of the Virus, THE JOURNAL A. M. A., Jan. 1, 1910, pp. 45-46.

3. Flexner, Simon; Noguchi, Hideyo, and Amoss, H. L.: Concerning Survival and Virulence of the Micro-Organism Cultivated from Poliomyelitic Tissues, Jour. Exper. Med., 1915, **21**, 91-102.

4. Amoss, H. L.: The Cultivation and Immunological Reactions of the Globoid Bodies in Poliomyelitis, Jour. Exper. Med., 1917, **25**, 545-556.

5. Flexner, Simon, and Noguchi, H.: Experiments on the Cultivation of the Microorganism Causing Epidemic Poliomyelitis, Jour. Exper. Med., 1913, **18**, 461-485.

6. Rosenow, E. C.; Towne, E. B., and Wheeler, G. W.: The Etiology of Epidemic Poliomyelitis: Preliminary Note, THE JOURNAL A. M. A., Oct. 21, 1916, pp. 1202-1205.

7. Mathers, George: The Etiology of Acute Epidemic Poliomyelitis, Jour. Infect. Dis., 1917, **20**, 113-124. Nuzum, J. W., and Herzog, Maximilian: Experimental Studies in the Etiology of Acute Epidemic Poliomyelitis, THE JOURNAL A. M. A., Oct. 21, 1916, pp. 1205-1208.

8. Nuzum, J. W.: Bacteriologic Findings in the Cerebrospinal Fluid in Poliomyelitis Serum, THE JOURNAL A. M. A., Nov. 11, 1916, pp. 1437-1439.

9. Rosenow, E. C., and Towne, E. B.: Bacteriologic Observations in Experimental Poliomyelitis of Monkeys, Jour. Med. Research, 1917, N. S., **31**, 175-186.

10. Rosenow, E. C.; Towne, E. B., and Wheeler, G. W.: Observations on Immunity of Monkeys to Experimental Poliomyelitis, THE JOURNAL A. M. A., Jan. 27, 1917, pp. 280-282.

11. At the time these experiments were reported, the monkeys had resisted one intracerebral injection of highly active virus. Since then, they have resisted three or four injections each of highly active virus without showing symptoms of poliomyelitis.

12. Mathers, George, and Tunnicliff, Ruth: A Reaction of Immunity in Acute Poliomyelitis, THE JOURNAL A. M. A., Dec. 23, 1916, pp. 1935-1936.

13. Neustaedter, M., and Banzhaf, E. J.: An Antipoliomyelitis Horse Serum, THE JOURNAL A. M. A., May 26, 1917, pp. 1531-1533.

14. Flexner, Simon, and Amoss, H. L.: The Rapid Production of Antidysenteric Serum, Jour. Exper. Med., 1915, **21**, 515-524.

15. Amoss, H. L., and Wollstein, W. M.: A Method for the Rapid Preparation of Antimeningitis Serum, Jour. Exper. Med., 1916, **23**, 403-417.

16. Fornet, W., and Müller, M.: Zur Herstellung und Verwendung präzipitierender Sera insbesondere für den Nachweis von Pferdefleisch, Ztschr. f. biol. Techn. u. Method., 1908, **1**, 201-206.

17. Bonhoff, H., and Tsuzuki, M.: Ueber die Schnellimmunisierungsmethode von Fornet und Müller (Präzipitine und Hamolysine), Ztschr. f. Immunitätsforsch. u. exper. Therap., 1909-1910, Orig., **4**, 180-194. Tsuzuki, M.: Ueber die Schnellimmunisierung nach Fornet und Müller (Agglutinine), Ztschr. f. Immunitätsforsch. u. exper. Therap., 1909-1910, **4**, 194-209.

18. Gay, F. P., and Fitzgerald, J. H.: An Improved Rapid Method of Producing Precipitins and Hemolysins, Univ. California Pub. in Pathology, 1912, **2**, 77-82. Locke, E.: A Rapid Method of Producing Bacterial Agglutinins, Univ. California Pub. in Pathology, 1912, **2**, 91-96.

umns for from eighteen to twenty-four hours at from 33 to 35 C. (91.4 to 95 F.). After centrifugalization, the supernatant broth was decanted and the bacteria were either washed or directly suspended in salt solution so that 1 c.c. of the suspension contained the growth from 15 c.c. of the broth culture. Most of the suspensions used were freshly prepared, but in some instances they had been kept in the ice chest for several weeks. All strains injected were cultivated for at least two generations, nearly all having been plated at least once on blood-agar. Blood-agar cultures were made of all suspensions at the time of injection.

Various methods have been employed for maintaining the original immunizing properties. Strains have been cultivated under anaerobic and aerobic conditions on blood-agar slants, in deep stabs of ascitic tissue agar and in tall tubes of ascitic tissue fluid. Strains from human poliomyelitis have been kept in latent life by preserving the brain and cord substance from animals paralyzed with cultures, in sealed pipets in the ice chest. Portions of the brain and cord and large quantities of recently isolated cultures from human and monkey poliomyelitis have been dried in vacuo.

EXPERIMENTS

HORSE 1.—A large black horse, 4 years old, weighing approximately 1,600 pounds, was given injections which were begun Nov. 2, 1916, and were continued until May 1, 1917. The first three injections contained heat-killed (60 C. [140 F.], thirty minutes) strains from the brain and cord of human poliomyelitis, the next nine injections contained strains both from human poliomyelitis and paralyzed monkeys, and all subsequent injections contained cultures of the pleomorphic streptococcus isolated from the brain and cord of monkeys paralyzed with virus in the usual way. The doses ranged from the equivalent of the growth from 160 c.c. of broth to as high as the equivalent of the growth from 1,400 c.c. Test bleedings were made previous to the first injection, and November 2, November 4, December 22, January 8, January 30, March 3, April 3, May 14 and May 16. December 27, three days after the third injection of living bacteria, the horse had fever, and his hind extremities were so weak that he could scarcely get up. The fever and weakness soon disappeared. April 5, a suspension containing staphylococci was injected accidentally. April 7, the horse had fever and developed arthritis of the right hock. April 9, he had arthritis of the knee of the left fore leg. April 17, the fever had disappeared, the arthritis had largely subsided, and the injections were resumed. Dead cultures, however, were now injected for the next three series of injections. The last dose was given, May 1, and consisted of the growth from 600 c.c. of broth of a strain in the third generation from a recently paralyzed monkey. May 14, the animal was unable to get up on account of weakness in the hind extremities. It was bled 6,000 c.c. May 16, weakness of the hind extremities still prevented it from getting up. It was then etherized and bled to death, approximately 36,000 c.c. of blood being obtained. A moderate amount of serous fluid was found in the left ankle joint and the right hock. There were no lesions of the viscera except a few subendocardial hemorrhages in the right ventricle. The vessels in the gray matter of the lumbar cord were hyperemic. Cultures of the blood yielded a staphylococcus, and those from the spinal cord showed diphtheroid bacilli. Frozen sections of the lumbar cord revealed little or no round-cell infiltration.

HORSE 2.—A large bay, 8 years old, weighing approximately 1,200 pounds, was injected at intervals, according to the method described, with live cultures from human and monkey poliomyelitis in relatively massive doses from November 22 to December 13. During the eighth injection (December 13) he developed marked symptoms of acute anaphylactic shock and died in a few minutes. He was bled just previous to injection and soon after death.

HORSE 3.—A medium-sized bay, 3 years old, weighing approximately 1,200 pounds, has been injected according to schedule since Jan. 30, 1917. The pleomorphic streptococcus from human poliomyelitis has been employed exclusively. The first six injections consisted of suspensions of the dried bacteria prepared last summer from strains recently isolated from the brain and cord. Later, there were added suspensions of strains found to be agglutinated in high dilution by the serum of Horse 1 and grown continuously on blood-agar, in deep stabs of ascitic tissue agar, or filed away last summer in sealed pipets containing the aspirated brain substances of rabbits and guinea-pigs paralyzed with cultures. Except for alarmingly severe symptoms on several occasions immediately following the injections, this horse has remained well. Test bleedings were made, January 30 (before injection), March 2, April 3 and May 14.

THE EFFECT OF IMMUNE HORSE SERUM ON VIRUS IN VITRO

In these experiments the technic followed was that used by other workers in this field. Five per cent. emulsions of physiologic sodium chlorid solution of fresh or glycerinated brain and cord were prepared by grinding the material in a mortar with sterile quartz sand, filtering it repeatedly through paper or in some instances passing it through a Berkefeld filter. The filtrate was thoroughly mixed with the serum to be tested, and, for controls, with the sodium chlorid solution and the corresponding normal serum. It was then placed in the thermostat for two hours and in the ice chest for from eighteen to twenty-two hours. All monkeys (*Macacus rhesus*) were injected intracerebrally, under ether, with 1 c.c. of the respective mixtures. In each series of experiments the monkeys chosen were of approximately the same weight.

TABLE 1.—THE EFFECT OF VARIOUS IMMUNE SERUMS ON VIRUS

Monkey	Inoculation	Result
103	Virus + NaCl solution; control	Mild symptoms; resisted second inoculation
93	Virus + normal monkey serum; control	Mild symptoms; resisted second inoculation
102	Virus + normal horse serum; control	Severe symptoms; etherized, 13th day
94	Virus + virus immune serum; Monkey 24	Remained well
95	Virus + culture immune serum; Monkey 43	Severe symptoms; recovered
96	Virus + culture immune serums; Monkeys 53 and 61	Remained well
97	Virus + culture immune serum; Rabbit 1078	Severe symptoms; etherized
98	Virus + acquired immune serum; Human 802	Remained well
99	Virus + acquired immune serum; Human 784	Remained well
100	Virus + culture immune serum; Horse 1	Remained well
101	Virus + culture immune serum; Horse 1; 1:1,000	Remained well; paralyzed by second inoculation

The experiment summarized in Table 1 was begun Feb. 7, 1917. The emulsion was prepared from fresh brain and cord of Monkey 85, which became paralyzed on the eighth day following the injection of a virus which had been passed successively through six monkeys. The first three experiments (Monkeys 103, 93 and 102), served as controls. All developed mild but unmistakable symptoms of poliomyelitis. Monkey 94, injected with virus digested with serum from Monkey 24, which had recovered from poliomyelitis, served as an additional control in that it showed the technic to be adequate for the destruction of virus by serum known to have such action. Monkey 95 developed severe paralysis, the serum of Monkey 43 not

having destroyed the activity of the virus. Monkey 43 had been injected previously with a strain of streptococcus grown large from typical globoids, and was found later not to be immune to virus. Monkeys 53 and 61, whose serums destroyed virus, as evidenced in the experiment on Monkey 96, had been immunized

TABLE 2.—EFFECT OF IMMUNE HORSE SERUM ON VIRUS

Monkey	Inoculation	Result
112	Virus + NaCl solution; control	Mild symptoms; recovered; resisted second inoculation
113	Virus + normal horse serum; control	Mild symptoms; recovered; died from ulcerative colitis, 35th day
114	Virus + immune serum; Horse 1	No symptoms; died of ulcerative colitis, 21st day; no infiltration
115	Virus + immune serum; Horse 1; 1:1,000	No symptoms; paralyzed by second inoculation
116	Virus + serum from sporadic poliomyelitis (521)	No symptoms; paralyzed by second inoculation

with cultures of the pleomorphic streptococcus recently isolated from paralyzed monkeys. Their serums agglutinated specifically the pleomorphic streptococcus from both human and monkey poliomyelitis. The serum of Rabbit 1078, which was used in the experiment on Monkey 97, had no digestive action on virus. Rabbit 1078 had been injected repeatedly with the heat-killed pleomorphic streptococcus. When used, its serum had been kept in the ice chest for forty days. The serums used in the next two experiments (Monkeys 98 and 99) were obtained from cases of sporadic anterior poliomyelitis, and destroyed the activity of the virus. The serum used to digest the virus in the last two experiments (Monkeys 100 and 101) was obtained from Horse 1, Jan. 30, 1917, eight days previously. It destroyed the activity of the virus completely, even in a dilution of 1:1,000.

In the experiment summarized in Table 2, the same virus after passage through one more monkey (Monkey 106) was used while fresh. The experiment was again controlled both positively and negatively. The controls with sodium chlorid solution and normal horse serum developed poliomyelitis, but the control with human poliomyelitis serum did not. The

TABLE 3.—THE EFFECT OF IMMUNE HORSE SERUM ON FILTERED VIRUS

Monkey	Inoculation	Result
141	Virus + NaCl solution; control	Symptoms, 5th day; completely paralyzed, 6th day; etherized
143	Virus + Immune serum; Horse 3	Symptoms, 8th day; severely paralyzed, 10th day; recovered
144	Virus + Immune serum; Horse 3; 1:1,000	Symptoms, 6th day; completely paralyzed, 7th day; etherized
146	Virus + Immune serum; Horse 1	Symptoms, 13th day; severely paralyzed, 16th day; recovered
145	Virus + Immune serum; Horse 1; 1:1,000	Symptoms, 5th day; completely paralyzed, 6th day; died, 7th day

horse serum used was obtained the day previously (March 2, 1917) from Horse 1. As in the previous experiment, it destroyed activity of the virus in dilutions of both 1:1 and 1:1,000.

The experiment summarized in Table 3 was begun, April 15, 1917. The effect of the serum from both Horse 1 and Horse 3 was tested against highly active glycerinated virus that had been passed through a Berkefeld filter. The control (Monkey 141) became completely paralyzed in six days, and was etherized when respiratory failure was imminent. The activity of the virus appeared to be diminished but not wholly destroyed by an activated mixture of serums from Horse 3, as shown by the experiment on Monkey 143. In dilutions of 1:1,000 the serum had little or no effect (Monkey 144). In the experiment on Monkey 146, an activated mixture of the serum from Horse 1 (January 30, March 3 and April 3) appeared to diminish the activity of the virus, as manifested by a delay of eight days over the control for the onset of paralysis, by the comparative mildness of the paralysis, and by the fact that the monkey recovered. In dilutions of 1:1,000 this mixture of serums had no effect (Monkey 145).

In an experiment performed Feb. 20, 1917, the inactivated serum from Horse 1, which was obtained

TABLE 4.—PROTECTION OF MONKEYS AGAINST POLIOMYELITIS WITH IMMUNE HORSE SERUM

Monkey	Inoculation	Treatment	Result
89 2.3 kg.	0.5 c.c. Virus 85	Intraspinal and intravenous injections of immune serum; Horse 1	No symptoms for 56 days; slight symptoms following second inoculation
90 3.8 kg.	1 c.c. Virus 85	Intraspinal and intravenous injections of immune serum; Horse 1	No symptoms for 56 days; severe paralysis, 9th day after second inoculation
91 2.2 kg.	0.5 c.c. Virus 85	Alternate subcutaneous and intravenous injections of heat-killed pleomorphic streptococcus	Severe paralysis, 11th day; no improvement following injection of immune serum, Horse 1; died of colitis, 19th day
92 2.5 kg.	0.5 c.c. Virus 85	Subcutaneous injections of heat-killed pleomorphic streptococcus	Severe paralysis, 13th day; recovered following injections of immune serum, Horse 1
147 3.5 kg.	0.5 c.c. Virus 889	None; control	Symptoms, 5th day; severe paralysis, 7th day; prostrate, 10th day; etherized
149 3.6 kg.	0.5 c.c. Virus 889	One intravenous injection of sensitized pleomorphic streptococcus, 11 days previously	Symptoms, 12th day; severe paralysis, 13th day; recovered
173 1.8 kg.	0.5 c.c. Virus 165	None; control	Severe paralysis, 7th day; apparent protection following injection of immune serum, Horse 1; recovered
174 1.8 kg.	0.5 c.c. Virus 165	Intravenous injections of immune serum; Horse 3	Severe paralysis, 10th day; recovered
175 1.7 kg.	0.5 c.c. Virus 165	Intravenous injections of immune serum; Horse 1	No symptoms; well 24th day

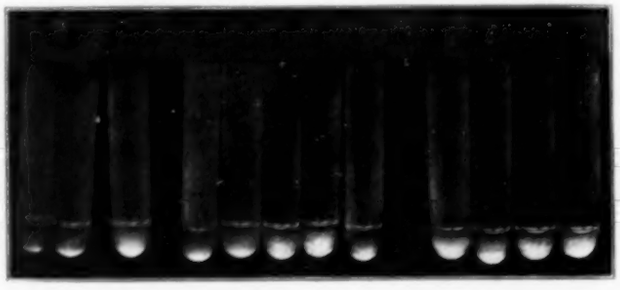
January 30 and which digested virus when fresh (Table 1) had only a slight destroying power over highly active fresh virus, the onset of the paralysis in two monkeys being delayed only one and two days, respectively, over that of the control. April 23, the serums of the bleedings of Horse 1 from January 30 to April 3 were mixed, and on April 24 the mixture was passed through a Berkefeld filter. This filtered mixture in one experiment was found not to diminish the activity of the virus. It appeared, then, that when fresh, the serum obtained January 30 and March 2 from Horse 1, immunized chiefly with the pleomorphic streptococcus from monkeys paralyzed with virus, had the power to destroy the activity of fresh, moderately virulent virus completely and to inhibit the effect of highly virulent glycerinated and filtered virus, a power which it appeared to lose on standing. The serum from Horse 3, immunized entirely with strains from human poliomyelitis isolated a long time previously, had no apparent effect.

PROTECTION OF MONKEYS AGAINST EXPERIMENTAL POLIOMYELITIS WITH IMMUNE HORSE SERUM

In Table 4 are summarized three series of experiments which were undertaken to determine the protective power of immune horse serum against intracerebral injections of virulent virus. The serum from Horse 1 used in the first series of experiments, begun February 7, was obtained, January 30.

Simultaneous intraspinal injections of 2 c.c. and intravenous injections of from 5 to 10 c.c. were made for two consecutive days. Five additional intravenous injections of from 5 to 14 c.c. were made every second or third day. The animals were completely protected, as shown by the controls (Monkeys 91 and 92) which were injected with a vaccine. They succumbed to poliomyelitis, however, following a second injection two months later, a further proof that infection had not occurred. Additional evidence of the activity of the virus is afforded by the results recorded in Table 1, this series of monkeys having been inoculated with the same virus.

In the experiments on Monkeys 147 and 149 (outlined in Table 4), the effect of a single immunizing dose of the sensitized pleomorphic streptococcus was tested against a heterogeneous virus of high virulence.[17] A mixture of strains from human poliomyelitis isolated last summer and recently isolated strains from paralyzed monkeys were grown in dextrose broth, washed in sodium chlorid solution and suspended in the filtered mixture of the serum from Horse 1. The bacteria were agglutinated almost immediately, and after the suspension had been kept at 35 C. (95 F.) for two hours were washed in sodium chlorid solution. Five c.c. of a rather dense suspension were then injected intravenously. That a degree of protection was afforded was indicated by a delay of seven days in the onset of the paralysis over that of the control, by the comparative mildness of the symptoms, and by recovery of the animal.



Agglutination of pleomorphic streptococcus from human poliomyelitis. This strain was not used in the immunization of horses. Tubes 1 to 3 contain normal horse serum; Tubes 5 to 9, immune serum from Horse 1; Tubes 11 to 14, immune serum from Horse 3. The dilutions of serum and antigen (dextrose broth culture) are 1:1, 1:10, 1:100, etc., respectively, in each series. Note agglutination in low dilutions and its absence in higher dilutions by the normal horse serum, and the absence of agglutination in low dilutions and marked agglutination in high dilutions by the immune serums.

In the last series of experiments, summarized in Table 4, the serums were obtained on the day the experiments were begun, May 14. Intravenous injections of 10 c.c. were made immediately after inoculation of virus, the following day and then every second day for four additional injections. The serum from Horse 3 had slight protective power, there being a delay of only three days over the control in the onset of symptoms (Monkey 174). The serum from Horse 1, on the other hand, completely protected Monkey 175, and two intravenous injections of 12 c.c. each appeared to protect the control (Monkey 173) from a fatal attack.

The effect of the curative properties of these serums after paralysis had begun has been tested, in all, in twenty-four monkeys. Simultaneous intraspinal (2 c.c.) and intravenous (from 5 to 12 c.c.) injections were given in three instances, and intravenous injections (from 10 to 12 c.c.) in the rest. In no instance were injections made oftener than once in twenty-four hours. If the serum had been kept for some time in the refrigerator, it was usually activated with guinea-pig complement just previous to injection.

If the serum appeared either to lessen the symptoms or to arrest the paralysis, or if the treated animals recovered when the untreated controls died of respiratory failure or surely would have died if they had not been etherized, the result was put down as favorable. If it had no apparent effect, it was put down as indifferent.

Out of seven treated monkeys in which the results were indifferent, four showed severe ulcerative colitis, two marked tuberculosis and one meningitis due to hemolytic streptococcus. These, therefore, were not suited for testing the efficacy of the serum. Of the remaining seventeen, the serum from Horse 3 was injected into four (once in one, twice in two and three times in one) with no apparent effect on the course of the disease in any instance. Three of these monkeys died, and one was etherized when respiratory failure seemed imminent. The remaining thirteen were treated with the fresh or activated serum from Horse 1. The results were indifferent in three and favorable in ten. All of the former received only one injection. Of the latter, two received one injection; two, two injections; one, three injections; one, four injections; three, five injections, and one seven injections. All of the ten recovered, with varying degrees of residual paralysis.

The experiments on the protective and curative power of these immune serums, therefore, indicate that while the serum from Horse 3 had little or no effect, the serum from Horse 1 had definite protective and curative power, a finding directly in accord with the results of the neutralization experiments.

PROTOCOLS OF EXPERIMENTS

Protocols of the last three experiments summarized in Table 4 will serve to illustrate:

Experiment 1.—*Control.*—Monkey 173, *Macacus rhesus,* 1.8 kg.

May 14, 1917: Etherized; 0.5 c.c. of glycerinated virus (751[11]) from Monkey 165 injected into right frontal lobe.

May 15-18: Appeared well.

May 19: Appeared irritable, no weakness.

May 20: Irritable and undoubtedly weak in left leg.

May 21, 8:30 a. m.: Tremor of head and muscles of hind extremities; unable to bear weight on legs, and dragged the right. 4 p. m.: Undoubtedly weaker; dragged both legs; had tremor and weakness of muscles of left arm. Twelve c.c. of immune serum from Horse 1 (obtained May 14) injected intravenously.

May 22, 8 a. m.: Definitely weaker in hind extremities; no extension of paralysis in arms. 3 p. m.: Injection of serum repeated.

May 23: Only slightly weaker in hind extremities; no demonstrable weakness in arms.

17. Kindly sent me by Dr. W. E. Wayson, of the Public Health Service, Washington, D. C.

May 24: Right arm badly paralyzed; hind extremities completely flaccid; left arm also weak, but monkey could move it in all directions.

June 2: Marked improvement; the tremor of the head had disappeared; arms stronger, animal pulled himself on perch; able to sit up but legs still flaccid.

June 7: Improved.

EXPERIMENT 2.—*Attempt to protect against virus with serum from Horse 3.* Monkey 174, *Macacus rhesus,* 1.9 kg.

May 14, 1917, 5 p. m.: Etherized; 0.5 c.c. glycerinated virus (751[11]) from Monkey 165 injected into right frontal lobe. 5:10 p. m.: Twelve c.c. immune serum, Horse 3 (obtained May 14), injected intravenously.

May 15, 12 m.: Appeared well; injection of serum repeated.

May 17, 9:30 a.m.: Appeared well; injection of serum repeated.

May 19, 3:30 p. m.: Appeared well; injection of serum repeated.

May 20: Appeared well; no weakness.

May 21, 7:30 a. m.: Appeared slightly irritable, but no weakness. 4 p. m.: Injection of serum repeated.

May 22, 3 p. m.: Extremely irritable; fur roughened; weakness of hind extremities; injection of serum repeated.

May 23: Weaker, very tremulous.

May 26: Marked paralysis of all extremities; some power in left arm; tremor of head still present.

June 2: Severe paralysis of all extremities; can move left arm slightly; tremor of head still present but less marked.

June 7: Condition much the same as on June 2.

EXPERIMENT 3.—*Attempt to protect against virus with serum from Horse 1.* Monkey 175, *Macacus rhesus,* 1.8 kg.

May 14, 1917, 5:20 p. m.: Etherized; 0.5 c.c. of glycerinated virus (751[11]) from Monkey 165 injected into right frontal lobe. 5:30 p. m.: Twelve c.c. of immune serum from Horse 1 (obtained May 14) injected intravenously.

May 15, 12 m.: Appeared well; injection of serum repeated.

May 17: Appeared well; injection of serum repeated.

May 19: Appeared well; injection of serum repeated.

May 20: Appeared well; no weakness.

May 21, 7:30 a. m.: Appeared well; no weakness. 4 p. m.: Injection of serum repeated.

May 22, 3 p. m.: Appeared well; injection of serum repeated.

May 23: Appeared well; no weakness.

June 7: Has appeared well and has shown no symptoms of poliomyelitis at any time.

AGGLUTINATION AND COMPLEMENT-DEVIATION EXPERIMENTS

Numerous agglutination experiments have been made with the pleomorphic streptococcus, with the serums from immunized horses, with the serums from patients who have recovered from poliomyelitis, and with the serums of monkeys paralyzed with virus. As controls, normal serums of these species and numerous strains of streptococci from sources other than poliomyelitis have been used.

The agglutinating titer of the serums of the horses (especially Horse 1) has become very high, agglutinations having been obtained in dilutions as high as 1:1,000,000. The serums from both Horse 1 and Horse 3 agglutinated alike the strains from human and monkey poliomyelitis as shown in the accompanying illustration. By the use of these serums it is now possible to differentiate the strains which appear to bear etiologic relation to poliomyelitis from strains of streptococci found in tonsils which undoubtedly have no such relation, and from strains of streptococci which may be found occasionally in the nervous system of uninoculated animals.

The serums from twenty-three patients who had recovered from poliomyelitis, and the serums from twenty-seven monkeys which became paralyzed following injections of virus have been found to agglutinate specifically the pleomorphic streptococcus isolated both from poliomyelitis in man and from experimental poliomyelitis in monkeys. The serums from forty-three persons who have not had poliomyelitis, and the serums from twenty-seven normal monkeys failed entirely to agglutinate these strains, or agglutinated them in lower dilutions than the respective immune serums. Only two of a large number of strains of streptococci from a wide range of sources were agglutinated by poliomyelitic serums to a degree comparable to the agglutination of the pleomorphic streptococcus. Antipneumococcus, antistreptococcus, antimeningococcus and antigonococcus serums had little or no more agglutinating power over these strains than normal horse serum.

Complement-deviation tests made by Dr. Sanford, while incomplete, show that both Horse 1 and Horse 3 have developed specific antibodies that in high titer have complement-deviating properties with the antigens made from strains isolated from human poliomyelitis and from experimental poliomyelitis in monkeys. Moreover, by using these immune horse serums for determining the properties of bacterial suspensions from various sources, it has been found in many instances that strains isolated from both human and monkey poliomyelitis have marked antigenic properties, while similarly prepared antigens from other sources do not have these properties.

SUMMARY

It has thus been shown that:

1. The serum of horses immunized with aerobic cultures of the pleomorphic streptococcus from both poliomyelitis in man and experimental poliomyelitis in the monkey developed specific antibodies, agglutinins and complement-deviating properties, the agglutinins appearing to be present in large amount because the serums cross-agglutinate these strains specifically in very high dilutions.

2. The serum of patients and monkeys which have recovered from attacks of poliomyelitis cross-agglutinates specifically many, but not all, of these strains in the lower dilutions.

3. What is of greatest significance, the serum of the horse immunized with recently isolated strains from experimental poliomyelitis in the monkey appears to have developed neutralizing, protective and curative power against the virus of poliomyelitis.

ABSTRACT OF DISCUSSION

DR. MYER SOLIS-COHEN, Philadelphia: In the Jules E. Mastbaum Research Laboratory of the Jewish Hospital, Philadelphia, Dr. George D. Heist and I made some immunologic studies of the streptococci found in poliomyelitis. We made agglutination tests which in a way are in accord with Dr. Rosenow's results, although we do not regard streptococci as lending themselves so well to such a test. We also studied the opsonic action of poliomyelitic serum on these streptococci. With the strain we employed, one isolated by Kolmer and his associates, we found an opsonic index above normal in all of the forty-five poliomyelitic serums we tested.

With the object of determining whether it is one strain of streptococci or several so commonly found associated with acute anterior poliomyelitis, we secured cultures also from Rosenow, Mather and Nuzum, who have isolated the streptococcus from poliomyelitis material in various parts of the country. We have grown these cultures side by side on the same mediums, and have applied to them fermentative and other cultural tests found useful in the classification of streptococci. We immunized rabbits with strains from the different sources, and with the immune serums so obtained

performed opsonic tests on each strain to see if a serum giving phagocytosis with the strain with which the rabbit was injected would act similarly with the other strains. In working with pneumococci, for instance, we have found, as have others, that a Type I serum contains thermostable opsonin for Type I only and not for Type II or III. With these same immune rabbit serums, we also performed cross-agglutinations, which gave results similar to those obtained in our opsonic tests.

With a few slight variations we have found that the strains sent us by the different workers are the same organism. Culturally and serologically there appears to be very little difference between the strains from different sources.

Dr. Carroll G. Bull, New York: Dr. Rosenow's paper interests me very much, since I have carried out a large number of experiments along this line. My results and interpretations were diametrically opposed to those of Dr. Rosenow. Streptococci or "poliomyelitis cocci" were isolated from the tonsils and central nervous tissues of patients having acute poliomyelitis and tested for pathologic effects on rabbits, guinea-pigs, cats, dogs and monkeys. To control these experiments, streptococci were isolated from a large number of nonpoliomyelitic patients and tested on rabbits and monkeys. The two series of cocci manifested similar pathogenetic properties, producing brain abscesses, purulent meningitis, kidney abscesses, arthritis and paralysis, but not poliomyelitis. Monkeys that recovered from the initial inoculations were given several subsequent injections to increase their immunity to the cocci. The serums of the immunized monkeys possessed specific opsonins and agglutinins to a marked degree, but they did not neutralize poliomyelitic virus in vitro, and these monkeys were just as susceptible to intracerebral inoculation of the virus as normal monkeys. These experiments were made not only once, but many times, and in no instance was there the slightest evidence that these cocci are immunologically related to poliomyelitic virus or have any relation to the disease.

Dr. Amoss has just completed some experiments which show that poliomyelitic virus is not only noninfectious for rabbits, but does not survive in the brain of these animals as long as seven days.

Dr. Rosenow's protection experiments with immune and normal horse serums are not convincing. The controls are not satisfactory. We cannot say that we have protected a monkey against a five-day virus unless a control animal is inoculated with the same emulsion or filtrate at the same time and succumbs to the infection within that limit of time. Mild symptoms following an intracerebral inoculation mean little or nothing. The control must come down. Salt solution and normal horse serum sometimes neutralize a filtrate of the virus. Agglutination tests with streptococci and allied organisms are very unsatisfactory, since the same strains tested at different times with the same serums give different results. It is possible that I failed to obtain the true "poliomyelitis coccus." In this case, paralysis and nervous infections were caused by other cocci, and these symptoms and lesions have no specific significance.

Finally, pyogenic lesions are difficult to reconcile with the pathology of poliomyelitis, since these complications have never been observed in cases of poliomyelitis in man or monkey. A disease as definite and self-limited as poliomyelitis must have a definite and fixed etiology.

Dr. A. I. Rubenstone, Philadelphia: Is it not possible that in immunizing experiments the presence of the brain serum has an enormous influence in protecting against toxicity? I have noticed that an injected virulent streptococcus mixed with a normal serum does exert a protective action.

Dr. E. C. Rosenow, Rochester, Minn.: I am delighted to hear that the strains I sent Dr. Solis-Cohen produced immune bodies which were specific for his strains from poliomyelitis.

Regarding the objections raised by Dr. Bull, I must say that the neutralizing and protective experiments were carefully controlled, and while rather weak virus was used in some of the experiments, highly virulent virus was used in others. One monkey was protected against a five or six-day virus, and a virus producing paralysis in this short time is conceded by all to be highly virulent. The agglutination experiments were thoroughly controlled and were done in sufficient numbers to exclude error which might be due to variations in agglutinability of streptococci in general.

Regarding the inability of Dr. Bull to obtain the same results in experiments on small animals, I need only to point out differences in the methods used as given in his report. He has grown the bacteria for injection chiefly on the surface of ascites dextrose agar; we have grown them chiefly in deep tubes of ascites dextrose broth with or without tissue. All but 10 per cent. of his injections were made with "streptococci" in the second or third culture generation; the majority of animals in our experiments received the primary culture or emulsions of tonsils, or the pus from abscesses in tonsils, and when pure cultures were injected, painstaking effort was made to obtain the more or less characteristic "pleomorphic streptococcus." His report includes only tonsil strains from human poliomyelitis, and only one strain from fresh brain and cord from a monkey paralyzed with virus adapted to this species; we have obtained positive results with both tonsil and brain and cord strains from fresh material from human poliomyelitis. He made his experiments during cold weather, as the epidemic was nearly over; we made ours in two widely separated localities during hot weather at the height of the epidemic. He injected twelve guinea-pigs weighing from 400 to 500 gm., with negative results; we injected hundreds weighing from 100 to 350 gm., with positive results in many.

Dr. Bull appears to expect "streptococci," without strict regard to their infecting or other qualities, although from poliomyelitis, to protect monkeys against virus. We have already emphasized in a published report that ordinary streptococci do not protect monkeys against virus, but this appeared to be so in two experiments with the pleomorphic streptoccus when in the proper condition.

The methods and conditions of experimentation will have to be more alike before conclusions can be drawn. The fact is that we have proved that in epidemic poliomyelitis there is present in the infection atrium and central nervous system a streptococcus-like organism which has peculiar properties. One of these is the tendency to localize electively in the central nervous system of animals producing lesions and paralysis, a property which it soon loses on artificial cultivation. These facts, together with the ones given in the paper under discussion, bear out the suggestion made previously that the pleomorphic streptococcus or micrococcus in some way bears etiologic relation to epidemic poliomyelitis.

Labor in the Warring Countries.—The National Children's Bureau in the interest of the children and youth of our country has been making a study of labor in the warring countries, under war conditions, and issues timely warning so that the unfortunate experiences of those countries may not be repeated in the United States now at war. French Minister of Munitions Thomas is quoted as saying:

"The experience of war time has only demonstrated the necessity—technical, economic, and even physiologic—of the labor laws enacted before the war. In our legislation secured in time of peace we shall find the conditions for a better and more intense production during the war."

In France and also in England earlier standards of hours, which were relaxed in the hurry of the first months of the war, are being restored, not only, it is said, to protect the health of the workers, but also for the sake of industrial efficiency, present and future. Canada, Australia and New Zealand are said to have maintained their labor standards with little variation. The status of this question in France at present is set forth in the official bulletin (July 31, 1916) on the uses of war as follows:

With the continuance of the war it becomes necessary not only to find the best possible disposition of the forces available for our war industries but also to avoid every cause for exhaustion or weakening of the labor employed in our factories. There is a close relation between the conditions in which we place our workers and the improvement or the increase of our war products. For the very sake of the national defense we must conserve all their physical strength for the workers who are responsible for the manufacture of arms and for the output of our factories.

PROPHYLACTIC USE OF VACCINES IN THE GREAT WAR *

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The diseases which are perhaps most detrimental to the efficiency of military bodies are those of the intestinal tract. To the ubiquitous dysentery and typhoid fever are added in Europe the paratyphoid fevers and cholera. It is particularly to combat these diseases that boiling of the drinking water, chlorination of the water supply, disinfection of the dejecta, and separation of the infected with or without symptoms, together with earlier and accurate bacteriologic diagnosis, have been so intensively and thoroughly practiced in the military bodies now fighting. With the manifold exigencies of war, however, these precautions are not sufficient, and the individual fighting unit must be given detailed attention. The failure of these general sanitary measures during this war involving trench fighting, together with previous military experience with antityphoid vaccination, was the incentive for attempts at immunization of the individual. Hence, in March, 1914, France adopted Labbé's legislation for compulsory vaccination against typhoid, and the execution of the law was vigorously prosecuted in October, 1914. The Russian Medical Association proposed similar vaccination in their army early in 1915, and the medical as well as some military authorities of England advocated compulsory antityphoid vaccination in the armies of Great Britain, at the beginning of the war. Reports show that the troops on the west front of the German army were vaccinated against typhoid in the late fall and winter of 1914 and 1915.

Anticholera vaccination has been practiced among those troops which were exposed in endemic areas, such as exist on the eastern front of the war zone.

Antidysentery vaccination has apparently not been widely practiced in the armies of the belligerents.

The problems involved in the attempts to immunize soldiers against these scourges have been summarized and emphasized by Theobald Smith.[1] Some facts to which he gives prominence are:

> The object of immunization is to raise the resistance of the body. . . . No kind of vaccination is invariably and completely protective. We may, however, hope to convert a fatal into a nonfatal attack, a mild attack into one so mild as to remain unrecognized, or into complete protection.
>
> The essential factor to be kept in mind is to raise such resistance with the least injury to the subject.
>
> There is a clearly marked distinction between groups of organisms as to the capacity of the hosts to be immunized experimentally.
>
> The object of immunization is to suppress the invader; the problem underlying is to find the precise aggressive weapons which prevent the invader from multiplying.

The principals of the group of organisms which concern us are those to which the hosts lend themselves well to experimental immunization; and one of the precise aggressive weapons is that which gives rise to the immune substances in the host, namely, the antigen.

ANTIGEN

The antigens or vaccines used in the various armies and military bodies have been as numerous as are the peoples at war. The preparation of these vaccines, however, has had for its guiding principle the conservation of all the "immunogenic qualities" of the organisms involved, and the destruction of their infectivity. The latter has necessitated the use of dead or greatly attenuated bacteria.

The attenuation or killing has been variously accomplished by heating, by the application of chemicals (chiefly phenols and ether), by autolyzing, and by sensitizing with an immune serum. Conservation of the "immunogenic" substances (some thermolabile) has been accomplished by using that degree of heat which closely approximates the thermal death point of the organism, erring on the side of too low a degree, and adding some chemical disinfectant as a preservative; by the use of chemicals alone; by autolysis, or by sensitization.

The English have made use of Wright's typhoid vaccine as modified by Leishman. This vaccine is monovalent (containing the one strain of the typhoid bacillus, the Rawling strain). The choice of this strain was dependent apparently only on its adaptability to homogeneous emulsification. The cultures are grown in plain broth for forty-eight hours, heated to 53 C., and made up to contain a 0.5 per cent dilution of compound solution of cresol. The vaccine contains a billion organisms to the cubic centimeter. Later the cultures were grown on agar and emulsified in salt solution.[2]

The Canadian contingents, at least some of them, were originally inoculated with vaccines made from agar cultures.

The French have used several vaccines, principally those of Chantemesse, Vincent and Besredka. Vincent states that the laboratory at Val-de-Grâce has supplied his vaccine to the armies of Greece, Italy, Serbia, Spain and Turkey. Vincent's vaccine is polyvalent (containing ten strains of the typhoid bacillus). The cultures are autolyzed in salt solution, and killed by exposure to ether for from thirty-five to forty minutes, which procedure extracts simultaneously many of the lipoidal substances contained in the organism. Vincent considers these lipoidal substances febrigenic and responsible in part for the local reactions.

The vaccine of Chantemesse is monovalent, made with agar cultures of from eighteen to twenty hours' incubation, emulsified in salt solution, and heated to 56 C. Tricresol is added to make a final dilution of 0.25 per cent. The vaccine contains a billion organisms per cubic centimeter.

Besredka's method is founded on the employment of a living, sensitized vaccine. The typhoid bacillus is grown for forty-eight hours on agar, emulsified, and antityphoid serum added. After twenty-four hours' exposure to the serum, the living organisms are decanted and washed, and then emulsified anew in physiologic sodium chlorid solution. The use of Besredka's vaccine seems to be limited.

Goldscheider states that Marx's vaccine was used in immunizing one of the divisions of the German army on the west front. This vaccine is apparently a heat-killed culture, emulsified in salt solution, to which phenol is added to make a final dilution of 0.5 per cent. The official German vaccine is made from agar cul-

* Read before the Section on Pharmacology and Therapeutics at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Smith, Theobald: Underlying Problems of Immunization, Address before the Congress of American Physicians and Surgeons, 1916.

2. Personal communication to the author.

tures, suspended in salt solution, killed at 55 C., and sufficient phenol added to make 0.5 per cent. Each cubic centimeter contains one third of an oese.

The Russians originally employed Wright's antityphoid prophylactic, but later used a polyvalent vaccine.

The choice of strains is dependent on several factors. Some authors elect the use of a strain from the local epidemic, but all are in accord that strains should be chosen with regard to their antigenic value. Toxicity is considered desirable by some and undesirable by others. This disparity of opinion is based on the question of the relation which toxicity has to "immunogenic" qualities. Estimates of these qualities are at present based on tests of agglutinogenic and protective power in experimental animals.

The experience of the English and Canadians, and thus far of the Americans, shows no preferential efficacy of a polyvalent, as opposed to a monovalent typhoid vaccine.

Dosage.—The dosage of these vaccines varies but slightly in the total amount given, and in the intervals after which the individual doses are administered. The total amount inoculated ranges from 1,600 million to 4,000 million bacteria, in the practice generally in vogue, and the intervals of dosage vary from five to eight days. While this is stated as the practice, it must be recalled that many of these vaccinations are most irregular in the periodicity of dosage, and incomplete in the number of doses, and consequently in the total amount administered. This irregularity and incompleteness of the vaccination occurs through military exigency, fabrication and illness on the part of the subjects, and, to some extent, on a lack of appreciation of the necessity for thoroughness by the sanitary officers.

The number of doses varies from two to four or more. It is the opinion of several authors who have made analytic studies of the effects of the vaccination that three at most, and frequently two inocculations are as effective as four or more.

There seems, however, to be a growing tendency to increase the total amount of antigen, in the belief, as Weber concludes from his findings in experimental work, that "the mass of vaccine injected is important, not only from the point of view of the solidity of the immunity, but from the precocity of its appearance; the more the dose is increased the more sure is the animal inoculated to have an immunity which will resist infection."

Fiessinger, who writes from an apparently large experience, concludes his studies with the admonition, "Do not vaccinate lightly."

Widal and Salimbéni recommend large doses, even as much as 10 billion organisms at a single dose, and conclude from their expermental observations on man that the reaction is not more severe than with lighter dosage. Their advocacy of a single injection of a large amount is with the obvious appreciation of the necessary irregularity and incompleteness of a vaccination divided into several administrations, over periods which permit troops being moved great distances from the place of initial inoculation.

Reinoculation.—The period after which reinoculation is practiced has been dependent largely on Wright's observations in India, and has varied usually from two to four years. Experience has apparently been contrary to inoculation at such long intervals, and the present practice seems to be a revaccination at from eight months to a year. No reports of a second revaccination were found, although there are reports of individuals who gave an anamnesis of typhoid at 16 years of age, in their early twenties, and again in the army in their early thirties.

VACCINATION

Methods of Vaccination.—These are chiefly parenteral, though Lumière and Chevrotier have advocated, and used enterally, gelatin-coated pills of a dried mixed polyvalent typhoid-colon vaccine. This method has not yet had an extensive use, but the English commission has reported unfavorably concerning its efficiency. The advantages of such a method of administration are self-evident, provided it were effective.

The technic of the parenteral administration is that of hypodermic injection, practiced aseptically. The sites most frequently chosen are the subclavicular, deltoid and subspinous areas. The skin is painted with tincture of iodin, or washed with alcohol, 60 per cent., and injection is made subcutaneously. With a battery of a few syringes and several needles, which can be intermittently boiled, several hundred men can be inoculated within a short space of time. Rubber-capped phials or bottles are used as containers for the vaccine. The Canadians, having exhausted their supply of rubber caps, used finger cots rolled up to make a strong collar for the neck of the bottle, and paraffined these for storage and shipment. Hermetically sealed ampules are also used as containers of the vaccine.

Results of the Vaccination.—The results of these various vaccinations may be analyzed from the standpoint of the immunization problems emphasized by Smith. In other words, what are the immediate effects on the host, and what are the effects on the course of the disease, and on its dissemination, since there is no absolute immunity?

Reaction of the Host.—The effects of vaccination vary, from those of local reddening and edema, persisting for twenty-four hours and progressively disappearing, to a severe general reaction, marked by shock and collapse. The percentage of general reactions is perhaps well illustrated by the observations of Maurange on 39,215 injections; he found the results given in Table 1. As will be noted, he does not define the various grades of reactions, but the high percentage showing no reaction would suggest that the operation was comparatively harmless.

TABLE 1.—PERCENTAGE OF REACTIONS OBSERVED BY MAURANGE

Types of Reaction	Typhoid Percentage	Para-B Percentage
None	92.23	98.59
Feeble	6.18	1.41
Moderate	1.40	0.00
Pronounced	0.19	0.00

The general reaction is usually accompanied by fever, the most common rise being to 38 C. (100.4 F.) or slightly higher. The symptoms occur within a few hours, beginning with depression, headache, anorexia, pains in the joints, and diarrhea. The most persistent of these symptoms is headache; but malaise frequently lasts forty-eight hours, and may be accompanied by anorexia. This degree of reaction is common in from 4 to 10 per cent. of robust men.

Severe reactions are usally attended by fever of several degrees, and by one or more of the following symptoms: rigors, vomiting and diarrhea, catarrhal icterus, prostration and collapse. These reactions may

persist for as long a period as fifteen days, and may occur after any one of the individual inoculations. The percentage of occurrence, however, is very small. To avoid these reactions it is necessary to be alert as to the contraindications to the vaccination.

Contraindications.—The age of the subject is of but little importance as a contraindication. Maurange states that he has carried out inoculations in individuals of from 4 to 46 years of age. Children show no reaction.

Contraindications may be divided into physiologic and pathologic groups. The most frequently occurring physiologic condition to be regarded as a contraindication is fatigue. It has been noted by most authors that men who are worn out from work and lack of food are prone to have a more severe reaction.

Among the pathologic conditions to be considered are angina and bronchitis, together with malaise or any of the prodromes of acute or chronic infections. The thermometer is here a valuable ally.

Patients with paludism and chronic syphilis need not be exempted from vaccination; but old tuberculous cases merit careful examination, and if the least doubt exists, owing to a history of hemoptysis or pleurisy or to the findings of anemia, rapid pulse, or fever, the patient should not be vaccinated.

Organic diseases to be enumerated as contraindications are noncompensating renal disturbances, diabetes, noncompensating myocardial and endocardial involvements, aortitis and arteritis, cachexias, gastro-intestinal disturbances, and alcoholism. Contraindicatory signs are high blood pressure, albuminuria, tender liver, and abnormal pulse findings.

A severe reaction to a previous inoculation should be considered a contraindication. There is, however, no objection to the administration of the first inoculation during the incubation period eight days immediately previous to the onset of typhoid fever.

With these contraindications in mind, the precautions to be observed in conducting the vaccination are evident, but may perhaps be emphasized with advantage.

Precautions.—Chief among these precautions is rest, for at least two days, for men vaccinated. Vincent attributes the lack of severe reactions in the Japanese experiences to the routine of two days' rest in bed following the injection, and the selection of the men vaccinated. A selection of men can be rapidly made by a query as to how they feel. Even this precaution serves to prevent the inoculation of those with malaise without fever who are in the incubation stage of acute infectious diseases, such as meningitis. Men concerning whom there are doubts should be examined carefully, including an interrogatory, observation of evening temperature, physical examination of the heart and lungs, and a urine examination. In one series, a routine urine examination of 6,040 young men revealed forty-four unsuspected albuminurias.

Goldscheider, Vincent and Maurange severally recommend, in doubtful cases, a test dose of 0.25 c.c. of the vaccine.

Maurange uses the pulse rate in repose as a criterion for the vaccination of tuberculous subjects, vaccinating those with a pulse rate of from 70 to 80, and not vaccinating those with a pulse rate over 90. He states that he has immunized 127 tuberculous patients without untoward results, and that persons with joint and bone tuberculosis stand the vaccination well.

The failure properly to select men for inoculation has resulted in some untoward complications following the vaccination.

Complications.—The complications noted have been those of arthritis, nephritis accompanied by hematuria and uremia, and pulmonary and intestinal involvements. The most frequent pulmonary disturbance was that of a dry, diffuse bronchitis. In several cases there was a recrudescence of pulmonary tuberculosis in which the fever remained high for a long time. Chantemesse has emphasized the occurrence of the recrudescences of tuberculosis during antityphoid immunization.

The severe reactions and untoward complications attendant on the neglect of the precautions emphasized have done much to retard the general adoption of a most efficacious prophylactic measure. It should be considered that not every one can be vaccinated against typhoid fever.

Among those, however, even in the presence of contraindicatory findings, who have been carefully vaccinated, the results are most favorable in the effect on the course of the disease, and perhaps on its dissemination.

COURSE OF THE DISEASE

The effect on the course of the disease is well established. The duration of the fever is lessened. The percentage of patients showing a temperature of 39.6 C. (103.3 F.) or over is lessened by about fourteen, in a study of 300 cases. The structure of the fever curve is the same in the vaccinated as in the nonvaccinated; but the duration of the fastigium is shortened, and in the vaccinated, it is more often absent. The fever curves of the vaccinated are more frequently those of light cases. A remitting form of fever is, however, more common in the vaccinated; also a condition of typhoid infection without fever is more common. This condition is one in which the patient's fever disappears, but malaise, diarrhea and rose spots persist.

The general condition of the patient is better in the inoculated than in the uninoculated. The toxic cerebral symptoms are lessened. The heart, pulse and respiratory activity are more favorably maintained. Complications are rarer in the inoculated, especially heart muscle affections, phlebitis and enteric hemorrhages, otitis and other purulent processes. There is no lessening of the recurrences by inoculation. Convalescence in the inoculated is frequently strikingly light and rapid.

Two inoculations seem to affect these changes more favorably than one, and three more favorably than two; four inoculations seem to have no greater effect than three. It is to be noted that these modifications correspond closely with the clinical pictures of paratyphoid infections; hence, a bacteriologic diagnosis is necessary for accuracy in the determination of the effect that antityphoid vaccination may have on the course of typhoid.

According to several investigators, who have made careful studies of agglutination curves in typhoid infections, among both the nonvaccinated and vaccinated, the determination of both diagnosis and immunity is most uncertain by this serologic test. The serums of many patients never agglutinate the infecting organism, and others lose the power to agglutinate before convalescence. Intercurrent febrile conditions, such, even, as angina and rhinitis, are sufficient to increase the agglutinating titer in the serum of the

vaccinated. Vaccination after a previous case of typhoid, even as remote as twelve years, tends to increase the agglutination titer of the serum. Hemoculture has been adopted as the safest criterion for the determination of the infection, and no test of immunity, other than exposure and reinfection, has been evolved. Positive findings by hemoculture are less frequent in the vaccinated.

The effects on the dissemination or morbidity of the disease cannot be shown with any accuracy from the reports which are at hand, and only a compilation, during times of less stress, of the experiences of the many military medical officers involved in this study will enable us to form an intelligent opinion. The reports submitted are fragmentary, usually emphasizing the effect on typhoid morbidity and mortality of one, two or three inoculations, in contrast with the nonvaccinated, without including any reference to the percentage of incidence in the entire division or corps of men, or even to the percentage of vaccinated in the nontyphoidal affections. Further, there has not been a scientific separation of the typhoid fevers, in many of these reports. However, in such careful and complete analyses as have been made, there seems to be a 60 to 70 per cent. protection against infection.

The mortality has been even more reduced, since the case mortality is about three times as great in the nonvaccinated as in the vaccinated.

English reports state that up to January, 1916, 1,365 cases of typhoid have occurred in the British army in France and Belgium. Further, up to 1916, the death rate for typhoid among the British troops in active service was less than that for the male civil population of similar age in England and Wales.

In those bodies of men concerning whom there are complete statistics with regard to the prophylactic use of the typhoid vaccines, such as in the Japanese marines and seamen, one finds a reduction in morbidity of approximately 66⅔ per cent., and an equally great reduction in mortality.

As indicated above, final conclusions cannot be drawn from the reports at hand. One of the great disparities in these reports is the failure to indicate what is meant by typhoid fever.

The separation of typhoid fever into three distinct infections was effected a long time ago, but the prevalence of paratyphoid, and the interrelations of typhoid and paratyphoid have become manifest much more recently. And only during the war have the paratyphoid infections become of great importance.

Widal and Courmont regard paratyphoid among the troops as the most prominent epidemiologic fact of the war.

Lehman, in a review in 1916 of our knowledge of the geographic distribution of paratyphoid A infections, considers this variety of paratyphoid to have had, previous to the war, a distribution relatively limited, in comparison with typhoid. He considers it a disease of tropical and subtropical Asia and Africa, and is dubious concerning the reports from Europe and America of the presence of the organism in food, in the intestinal canal of animals, in water, and in milk. He believes that its dissemination is chiefly through the medium of "carriers," especially as it usually runs a light course, and presents many ambulant cases.

The expeditionary forces at the Dardanelles had a considerable incidence of paratyphoid infections among them.

Landouzy, in December, 1914, reported a predominance, in certain districts of France, of the paratyphoid fevers over the typhoids.

Bernard and Paraf, in an analytic study, reported in 1915 a great preponderance of paratyphoid infections in the antityphoid vaccinated over those in the nonvaccinated, presenting the remarkable figures given in Table 2. Unfortunately these authors do not give the relative proportion of the normal contingents who were given the antityphoid vaccination. Rist, however, in 1916 reported a careful analytic study of a small series of 215 cases of typhoidal infection with 621 controls of nontyphoid diseases, among which he determined the percentage of antityphoid vaccinations. *He finds that the percentage of protection afforded against infection with typhoid is offset by the same percentage of increase in paratyphoids.* This percentage is identical, to within a figure in the second decimal place.

TABLE 2.—PREPONDERANCE OF PARATYPHOID INFECTIONS OVER TYPHOID

	Cases	Vaccinated	Non-vaccinated
Typhoid (Eberth bacillus) ...	77	45	32
Paratyphoid	248	222	26

Labbé also reports in 1916 the figures concerning antityphoid vaccination given in Table 3.

TABLE 3.—PROTECTION AFFORDED BY ANTITYPHOID VACCINATION

	Cases	Vaccinated	Non-vaccinated
Typhoid (Eberth bacillus) ...	241	19	222
Paratyphoid	150	120	40

These French experiences, together with those of the expeditionary force at the Dardanelles, have shown the relative futility of vaccinating with the simple typhoid vaccine, and have resulted in the serious consideration, and to some degree, adoption by the French of a triple vaccination, simultaneously administered, or of a triple mixed vaccine.

MIXED VACCINES

Experimentation by Widal and others has shown that vaccination of animals with equal parts of the three heated vaccine viruses (typhoid, paratyphoid A and paratyphoid B) produces in their blood evidences of simultaneous immunization against the three infections.

Kabeshima reduced the morbidity of typhoidal fevers among the Japanese marines by injecting separately the vaccines of typhoid, and paratyphoid A and B. He states that the simultaneous injection of the three vaccines was not attended by a greater percentage of severe reactions in experimental animals or men than was the injection of the simple typhoid vaccine.

Independent of the vaccinations practiced with this method against the three diseases, the Japanese physicians have had recourse to another preparation, a triple vaccine against typhoid and paratyphoid A and B prepared by mixing in equal parts each of the three heated viruses.

From his experiments on guinea-pigs with the use of this mixed triple vaccine, Kabeshima has established the fact that these animals acquired a resistance to the virus of each of these diseases equally as strong as when the vaccinations were made with the separate vaccines.

With respect to man, the injection of the triple mixed vaccine has been effective aboard the Japanese war vessel *Katori*. What the results were in these sailors, from the point of view of effectiveness, after vaccination with this mixed triple vaccine, the author does not state; he speaks only of the reactions which were caused by this triple method.

Reactions and Inconveniences of This Vaccine.—This combination of the three vaccines raises another question.

The persons who receive the triple vaccine, according to the Japanese authors, do not show local or general reactions appreciably stronger than those caused by a dose of the simple vaccine. It is known, however, that these reactions last at least two days, and that the number of the vaccinated who show a fever between 39 and 40 C. (102.2 and 104 F.) after the triple vaccination is twice as large as after the simple vaccination. According to Kabeshima's figures, the proportion is about 5 per cent. of those inoculated, with the use, however, of six times the amount of bacilli per cubic centimeter as in the simple vaccinations.

Vincent, in describing previous experiences of the French with a triple mixed vaccine, and commenting on the procedure, with the view of adopting a method of triple immunization, gives a comprehensive criticism of the problems involved. He says:

> In 1913, and also in 1914, it was further used at Oudjda under the direction of Dr. Grenier; the respective proportions of the three antigens was in 1913: typhoid vaccine, two-thirds; paratyphoid A or B, one-third; in 1914, equal parts of these. . . .
>
> The immunity conferred on men, to the number of more than 4,000, who have received the mixed vaccine, was shown to be as *effective against paratyphoid fevers as against typhoid*. The same results have been reported in the Italian army.
>
> It has been clearly established, by observation made in man, that the protective effects due to the three mixed vaccines are not neutralized. They are superimposed in the same way when one vaccinates simultaneously against typhoid and against smallpox, a common practice in France, or against cholera and smallpox. . . .
>
> It may be stated here, that if a really effective immunizing result is to be obtained with the mixed vaccine, it is self-evident that it is necessary to inject simultaneously the necessary dose of each vaccine in order to produce the immunity against each of the three diseases.
>
> It follows, then, that if one seeks to obtain at once the triple immunity, the advantage can be counterbalanced by a practical inconvenience, not at all to be ignored, namely, the increase of the number of local and general reactions.
>
> Such is in fact the factor which may hinder the generalization of the immunity with a mixed vaccine.
>
> Dr. Grenier has stated to me that in the last attempts which were carried out at oriental Morocco in 1913 and 1914, the reactions in the soldiers vaccinated with the mixed vaccine were moderate, hardly more severe than those caused by antityphoid vaccine alone; but for vaccination a selection of the men had to be made, those who were well rested.
>
> Under the present conditions, in soldiers recently enlisted exposed to the fatigue of military initiation, marches, daily drills, night marches, or those stationed in the trenches or in the neighboring camps and exposed to the conditions of war, it appears wiser to make series of the antityphoid vaccinations and the antiparatyphoid, except under special conditions which permit the mixed vaccination.
>
> This practice of successive vaccinations has been carried out a large number of times, notably at Val-de-Grâce. Those who have been successively injected with the different vaccines have not complained of fatigue and have not shown abnormal febrile reaction. They have appeared regularly for the full series of injections.
>
> Moreover, it is possible greatly to simplify this practice. A good immunity can be obtained with two injections of antityphoid vaccine. This reduced vaccination, made with doses a little increased, was practiced on my recommendation on a large number of men at the beginning of the war. It has been very effective. These two antityphoid injections can be then followed by two or three injections of antiparatyphoid vaccine A or B, or A plus B. This last mixture, which contains only two vaccines is well supported.
>
> We endeavor, for this reason, to extend the employment of the antiparatyphoid vaccine when it is necessary. In special cases, of which the vaccinating surgeon is the best judge, the mixed vaccine can be used. In a general way, it appears preferable, especially under the conditions stated, not to extend this practice systematically; especially when it is possible to make successive vaccinations.

Widal and Chantemesse concur in this opinion on the use of a triple mixed vaccine. (Incidentally the method of separate triple vaccination is that practiced in the American army.)

The paratyphoid fevers are common in the Italian army, and pursuant to the advice of Vincent this army has been using his etherized, mixed, triple vaccine since 1912.

Tarrasevitch states that the Russian army made use of simultaneous vaccination against the three typhoids in the later vaccinations; and further, that in Moscow, 25,000 men received simultaneous vaccination against the typhoids, cholera and smallpox with only 5 per cent. presenting a moderate or severe reaction.

Castellani states that 170,000 Serbian soldiers were vaccinated with a combined tetravaccine recommended by him, which included cholera together with the three typhoids. The vaccines were prepared by killing twenty-four hour agar cultures suspended in salt solution with phenol.

CHOLERA

Reports on the use of anticholera vaccination are confined largely to experiences on the eastern front.

The anticholera antigens are prepared by heating suspensions of twenty-four hour agar cultures in physiologic sodium chlorid solution and by phenolizing these; or only by phenolizing the suspensions, adding phenol to a strength of 0.5 per cent. The official German vaccine contains two oese of culture in a cubic centimeter. Killed organisms are always used, as opposed to Haffkine's method of vaccination with attenuated live organisms; strains are chosen from the local epidemics.

The vaccine contains usually 2 mg., wet weight, of organisms to the cubic centimeter.

The dose administered is 1 c.c., followed in from five to seven days with a second dose of 2 c.c.

Anticholera vaccination has been made compulsory in the Austrian army, and provisions have been made for vaccinating the civil communities in the area of military operations. Reinoculation for cholera has been instituted after three to four months, since the immunity is evanescent, apparently lasting only from six to seven months.

Bujwid, who used a sensitized typhoid vaccine and phenolized cholera vaccine, notes that the typhoid reaction is more severe than the cholera reaction, the latter producing a painful swelling in a few hours, with a rise in temperature to 38 C. (100.4 F.), rarely to 39 C. (102.2 F.), and is of shorter duration than that of the typhoid.

Bujwid states that anticholera vaccination is not as efficient as antityphoid vaccination. Hoffman, however, reported that among German troops, when advancing in the regions of the Bug and Rokitano marshes, the mortality among the uninoculated was from 35 to 50 per cent., while among those inoculated it was from 0 to 20 per cent.

Kaup (Austrian) stated that after the soldiers had been inoculated, the morbidity was from 1 to 5 per cent., though the exposure was great. The course of the disease was mild, and the mortality was from 0 to 20 per cent., as opposed to from 40 to 60 per cent. in the uninoculated.

A Polish newspaper, in commenting on a winter epidemic of cholera in Poland, remarks, "Cholera seems to be a disease which attacks the civil population and spares soldiers."

While anticholera vaccination has been restricted largely to its use among troops operating on one front, the results obtained are favorably comparable to those obtained from antityphoid vaccines.

Concerning the third important intestinal disease, dysentery, reports are very sparse.

DYSENTERY

Antidysentery vaccinations have apparently not been widely practiced.

Hever and Luksch report their use in a small epidemic in a civil community in Germany. The strains found were both the Shiga-Kruse and the Flexner. Their results are not convincing.

The English have been experimenting with several chemicals for the detoxication of the Shiga-Kruse types, and have some preparations of vaccines made in this manner.

Castellani recommends a polyvalent vaccine containing the strains of Shiga-Kruse, Flexner and Hiss-"y," to be prepared by killing twenty-four agar cultures suspended in salt solution with 0.5 per cent. phenol, and administering doses of 125 million organisms, contained in 0.5 c.c. of suspension.

Hever and Luksch found that children bore the antidysenteric vaccination well with slight or no symptoms, and that no untoward effects were produced in adults.

Landouzy warns us that much of the "trench diarrhea and dysentery" is caused by paratyphoid infection, in which diarrhea is practically a constant finding.

CARRIERS

The modification of the usual course of these diseases, to that of a mild febrile disturbance, with many ambulant cases, or to one without symptoms, recognized only by a routine bacteriologic diagnosis, has introduced another problem for the military and for civil communities — the "carrier" problem. Many of these vaccinated patients become carriers, especially those vaccinated against cholera.

Kaup, who had a large experience with cholera, warns of the danger of the carrier, especially with regard to his transportation to prison camps and to civil communities. He states that many carriers develop in new troops vaccinated, and coming to the front in the presence of cholera.

Rosenthal and Werz, who made some studies in the German army, found nearly 2 per cent. of carriers in a general examination of 686 wounded. In 248 cases examined, the cholera vibrio was found in 3 per cent. of those inoculated twice. Of the carriers, nine showed no agglutinins in their blood, and but two a weak reaction. They found difficulty in distinguishing between the carriers and the light cases.

SUMMARY

The present war has emphasized the inadequacy of general sanitary measures, without individual immunization, in the prevention of the infectious diseases of greatest military importance, namely, the intestinal infections.

The problems in this immunization are those common to all artificial immunization, modified by the readiness with which the hosts lend themselves to the reaction to the group of organisms involved.

The antigens used during the war have varied somewhat in respect to preparation and dosage. However, they have had as the basic principle for their preparation the choice of that method which conserves the immunogenic characteristics, with a destruction of their infectivity.

There seems to be a tendency toward increasing the dosage of the antigenic principles, based on the facility of administration of the entire dosage, at one inoculation, and on the belief that the mass of vaccine injected is important.

The period of immunity, after these vaccinations, is in general shorter than has been supposed hitherto, as determined by Wright's observations in India.

The methods of vaccination practiced are both enteral and parenteral. The former method is of limited usage, and does not at present promise good results.

The parenteral injections are made subcutaneously, and can be carried out very rapidly. With the proper selection of robust men, preferably under 40 years of age, this method is unattended by severe results.

The results of the vaccination may be variously considered from the standpoint of the effects on the subject, on the course of the disease in the host, and on the frequency with which the disease attacks, and on its rapidity of dissemination.

The subject reacts locally by redness and swelling, and, in a small percentage of patients vaccinated, by a general reaction.

The general reaction may be light, consisting of headache, anorexia, and slight fever; or severe, with a mild reproduction of the typhoid fever syndrome, or with more toxic symptoms.

These severe reactions, as well as complications attending them, can be largely avoided by attention to contraindicatory signs and conditions.

Such contraindications are both physiologic and pathologic. Chief among the physiologic conditions is fatigue; and among the pathologic states are those conditions prodromal to acute and chronic infections, together with organic, respiratory, renal or circulatory involvements, and systemic diseases.

Failure to adopt the precautions of rest following vaccination, and of a selection and examination of men about whom there is doubt concerning their fitness for vaccination, may lead to such complications as nephritis, pulmonary and intestinal involvements, and even the recrudescence of a subsiding or latent tuberculosis.

The effect on the disease is to shorten its duration and to mollify its intensity. While such positive statements cannot be made with regard to the protection afforded against infection, there is sufficient evidence

to show that both the morbidity and the mortality are greatly decreased.

The diagnosis of typhoid fever has been made more difficult by vaccination, since the serologic reactions usually found are altered by vaccination. Hemoculture affords the best criterion for diagnosis, and here again vaccination has interfered by making the cultivation of the causative organism from the blood apparently more difficult.

Careful studies have shown that, with the separation of the typhoid fevers, there has been a tremendous prevalence of paratyphoid infections current, with reduction of infection by the bacillus of Eberth following vaccination. Since no protection seems to be afforded by simple antityphoid vaccination against the paratyphoid infections, triple immunization is recommended and practiced by simultaneous injection of vaccines of each of the organisms, or by injection of a mixed vaccine containing all three.

The method of triple immunization has been found to be efficient in reducing the morbidity and mortality from these fevers in the Japanese experience, and in that of the French at Morocco. The reactions attending this method are not of much greater severity than those of the simple antityphoid vaccination.

Anticholera vaccination has been limited to the troops engaged on the eastern front. The vaccines have been made of killed cholera vibrios, of local strains. They are administered in two doses, and are productive of less severe reactions than the typhoid vaccinations used on the Austrian eastern front.

The immunity is more evanescent, necessitating reinoculation after an interval of from three to four months.

The results of the vaccination were favorable on the course of the disease, its morbidity and its mortality.

Antidysentery vaccination has been but slightly practiced.

The modification of the course of these intestinal infections, to that of a mild febrile disturbance, has produced many "carriers" and has thereby created an additional serious problem for both the military and civil communities.

ABSTRACT OF DISCUSSION

DR. FRED I. LACKENBACH, San Francisco: Will Dr. Wayson explain the matter of dosage? If, in using mixed vaccines, he doubles or trebles on the dosage over the single strain? Also, if by "mixed" vaccines he refers to the *Bacillus paratyphosus* A and B, as well as the *Bacillus typhosus?* Also, has the United States government adopted the use of the mixed vaccines in its practice?

DR. J. F. ANDERSON, New Brunswick, N. J.: I should like to ask Dr. Wayson if the Besredka vaccine was a living vaccine or a killed vaccine, and the periods of potency of the vaccine used.

DR. HERMAN SPITZ, Nashville, Tenn.: Regarding Dr. Wayson's statement that the use of a vital reaction is unreliable in these conditions, I should like to report that in a series of some 200 patients (including both sexes and all ages) who received the prophylactic vaccine, the Widal reaction was uniformly negative. The vaccine used consisted of two strains of *B. typhosus* and one each of *B. paratyphosus* A and B. Three and four doses were given. I want to ask Dr. Wayson if he can offer some explanation why the Widal is negative.

DR. WALTON F. DUTTON, Tulsa, Okla.: For the benefit of those who practice in malarial districts I would cite one case. Last summer I treated a patient with estivo-autumnal fever with quinin. The patient recovered from the attack of malaria, but did not appear to improve in general health. The condition simulated a pretyphoid state. Typhoid prophylactic vaccines were used and the patient began to improve rapidly and made a good recovery.

DR. CARL C. WARDEN, Ann Arbor, Mich.: I believe that ultimately the solution of the healing of infectious diseases will be attained through these vaccine therapies; and I believe the most recent advances are those outlined by Dr. Miller today. The question how vaccines work comes up. Recent studies on the toxicity of human and other serums have shown the following facts: that blood lymph or whole blood or serum or plasma may be rendered toxic by almost any substance brought in contact with it. In other words, the serum may be rendered toxic not only by bacteria, but also by certain protein solutions, by substances such as agar, starch, charcoal, kaolin or any other substance which possesses surface. Studies show that a serum so rendered toxic will produce certain symptoms in some animals but not in other animals into which the serum is injected, or will reproduce the same reactions in the body of the animal as in the diseased body. These are anaphylactic reactions and may be produced in any degree. This seems to indicate that the action of the substance is a physical one, as the same reaction may be produced by any substance. Two serums may differ as to accomplishing the same thing because of variation in the precipitation of the globulins. The injection of vaccines into the human being apparently excites a definite reaction which must be regarded as anaphylactic shock, and this anaphylaxis is part of the immune reaction going on in the body as a result of infectious disease; but that is not all of the immune reaction; accordingly, such treatment as is applied to infectious diseases will yield a certain percentage of good results in a large number of cases, but will not cure all cases of infectious diseases. Granting that these reactions are part of the grand immunity process, we have evidence to show that a great many so-called immune reactions are also part of the same grand immune reaction. Precipitins and agglutinins, complement fixation and opsonins and anaphylaxis may be regarded as representing different phases only of the same large phenomenon of immunity. If we consider such reactions as precipitins or complement fixation, we can show that they occur between three substances—the antibody, the complement, and the antigen which permits a definite reaction to occur with the adsorption of complement. In syphilis and gonorrhea, to which I particularly refer, we have such immune reaction depending on the specificity of an appropriate antigenic substance of a fatty nature. When experimentation on infections shall have progressed further, then the application of vaccine therapy to infectious diseases will start on its right course.

DR. NEWTON WAYSON, Washington, D. C.: The dosage of mixed vaccines varies considerably in practice. There is, however, the usage of the same proportion of each organism, simultaneously given, in a maximum of 500 millions in the first dosage, 1,000 millions in the second. There is a tendency to make the dosage larger, rather than smaller. The United States practice I cannot give you authoritatively, but I am informed that all troops will be vaccinated against typhoid and paratyphoid, and the mixture of paratyphoid A and B and typhoid will represent one third and two thirds, respectively. It will be a simultaneous triple vaccine and not a simple mixed vaccine. The simple typhoid vaccine will be given in the usual dosage. By mixed vaccine I mean a vaccine composed of typhoid and paratyphoid A and B. By triple simultaneous vaccine, I mean vaccines by three injections: one of the typhoid, one of the paratyphoid A, and one of the paratyphoid B. The Besredka vaccine is not a killed vaccine. The period of potency of vaccine is uncertain. Weber and Wassermann, who have done considerable experimental work, think a vaccine should age three weeks, and that beyond this, the age may be almost indefinite without affecting potency. Their experimental work was on laboratory animals.

The unreliability of the Widal reaction is dependent on two factors. I cannot explain why the agglutinins disappear; but it has been found on careful analyses in typhoid fever that the Widal reaction occurs at very irregular periods,

appearing as late as the eighteenth or twentieth day of the disease, as early as the seventh or eighth day, and sometimes never occurs. Also, first to occur may be a predominant agglutination for the typhoid bacillus, later a predominance for the paratyphoid A or B, and later a rising agglutination for the paratyphoid A or B bacillus. A second factor which makes the diagnosis unreliable is that a patient vaccinated against typhoid may show toward the typhoid bacillus a high agglutination titer, which disappears, to return when the patient is affected with a slight bronchitis.

WAX PARAFFIN FILM IN THE TREATMENT OF BURNS*

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Following the suggestion of Dr. D'Arcy Power, and using his formulas for a film, I have completed treatment in 100 out of about 250 cases treated. After the hundredth case I ceased to record the histories. The treatment was used in certain selected cases in which it seemed most indicated. The patients were selected from my service at Merritt Hospital and the Union Iron Works. Brush burns or superficial abrasions or epithelial scraping of skin surfaces are included in this number, burns from electric current, fuse explosions, hot rivets, molten metal, oil flames, hot bitumen, steam, scalds and dry heat, as well as granulating surfaces. Burns are usually localized, while the scalds are more extensive. Their pathology being the same, the treatment will be considered together. For the sake of brevity, these various burns will be considered under three headings: first degree, those which involve the superficial layer of the skin characterized by redness without vesication; second degree, those which involve the corium and are characterized by the formation of vesicles and bullae, and third degree, those which destroy the entire skin and partially or completely carbonize fat, fascia, muscles and underlying structure.

FIRST DEGREE BURNS

Case 1.—J. R., rivet heater, had a flash burn on the side of the neck from a sudden explosion of crude oil. The burn extended from the maxilla down to the shirt collar from the front of the neck to well back under the ear. The first treatment consisted of cleansing the part of grease and dust particles with 0.5 per cent. iodin in benzin. The part was then thoroughly dried with a small warm air electric blower, such as hair dressers use for drying the hair. A very fine filament of wax was now sprayed over the surface. No other dressing was applied. The application relieved the pain. After three similar applications at intervals of twenty-four hours, the patient was discharged as cured. The film in this type of case must be very thin. A thicker coating without a gauze dressing will curl up and peel off.

Case 2.—A similar burn covering the entire back of the neck was treated in the same way, and the patient was discharged after two applications.

Case 3.—A flash burn the size of a dollar on the left cheek was given three applications, after which the patient was discharged.

There being no broken surface and no chance for infection, the type of burn illustrated in Case 2 generally is cured in a few days with any of the recognized treatments. Carbonized carron oil, phenolated grease or petrolatum, starch and soda, anything that excludes the air, generally gives relief. These burns are seldom covered by dressings unless they are on the hands.

SECOND DEGREE BURNS

These are the most common, over 70 per cent. being tabulated out of the entire group. The majority are infected, especially if oils and medicated grease are applied as a first dressing. Carron oil, composed of equal parts of lime water and sweet oil, is popular among mechanics, but it is the bugbear of the surgeon. Many patients treat themselves first, and then come to the clinic for treatment of the infection.

Case 4.—A second degree burn on the anterior surface of the leg, 3 by 4 inches square, was treated for seven days by moist dressing. The skin was thoroughly dried, every pocket of superficial skin was removed with cuticle scissors, and the wax film was applied. A considerable discharge looking like yellowish pus followed the first dressing, but this soon cleared up.

The continued moisture collecting under the wax seems to be one of the great disadvantages. However, this wound healed kindly under twenty-seven days' treatment of daily wax application, which I consider a fair result. It would probably have healed just as quickly under a moist dressing of physiologic sodium chlorid solution, sodium bicarbonate solution or a 1 per cent. watery solution of picric acid, the advantages of the latter being that the dressings can often go from two to five days without being changed.

Case 5.—A brush wound covering the entire outer aspect of the right arm from the shoulder to the elbow, superficial in character yet one which should be classified as a second degree injury, showed but little contusion; the superficial abrasion was caused by the breaking of an air hose, causing a friction rub over the outer aspect of the arm denuding it of the superficial epithelium. The wound healed completely under six daily applications of wax.

This I consider an ideal case for wax treatment. This type of wound is not so serious as it looks, especially if the deeper structures of the skin have not been traumatized, and there is no extensive hemorrhage from the surface. They always become infected if grease is applied, and it is always tempting to place a medicated salve over this type of injury. It requires two or three weeks to heal up the infection, especially if the grease application is continued. These wounds do well under a dry application of dusting powder, one part of salicylic acid to three parts of boric acid. However, the wax worked admirably in this case, probably better than any other form of treatment would have done.

Case 6.—A foot burn covering the anterior aspect of the foot from the ankle to the toes, while classed as a second degree burn, presented three or four small areas that were much deeper which seemed to be very slow in healing. Many of these burns could be classified as first, second and third degree. In these small areas I placed small pledgets of gauze saturated with phenolated camphor, and then covered the entire area with wax. This worked nicely. The burn healed under fourteen daily treatments of the wax film.

Case 7.—A burn on the back of right hand, the size of a silver dollar, seemed very stubborn under the wax treatment, requiring thirty-seven daily treatments. I imagine it would have healed much faster under a picric acid or boric acid compress.

The great majority of all patients with burns continue working. One can well imagine how slow the healing must be in a malleolus burn the size of a silver

* Read before the Alameda Medical Association.

dollar, especially when it approaches the third degree. Perhaps, therefore, in recording the results of these cases, I am not doing justice to the wax film or any other method of treatment, because the parts are not placed at rest.

CASE 8.—An extensive forearm burn from hot bitumen involved the posterior aspect of the arm from the wrist to the elbow. The bitumen film was peeled off, and the superficial blistered skin removed. The arm was washed with warm phenolated solution, and then cleansed with 0.5 per cent. iodin-bezin solution. A moist compress of neutral solution of chlorinated soda was changed twice daily for four days. The wax treatment was then applied and continued for sixteen days. The wax was left on for twenty-four hours. Each day there was a free puddle of yellowish pus-like material of seropurulent character under the wax film. This puddle of exudate was so abundant that I was compelled to discontinue the treatment. Each day the wound was cleansed. A moist compress of neutral solution of chlorinated soda was placed over the surface for ten minutes, then the surface was glazed dry with the hot air blower, and the wax was applied. The wax treatment in this case continued for sixteen days without any apparent improvement anywhere on the wound. I then placed moist picric acid gauze on the arm, and had the patient return in forty-eight hours. Parts of the wound were now dry. Some were still moist. I renewed the picric acid gauze and directed him to report in three days. One half of the wound was now dry, covered with a dry yellow film of stained epithelium. The next dressing showed the wound covered with dry epithelium, except a patch the size of a dollar which was covered with granulations. This was the condition of the wound after thirty days' treatment. The patient then moved to San Francisco. What has become of the granulating patch I do not know. Perhaps the preceding wax film treatment facilitated the rather rapid healing under picric acid, but the abundant secretion under the wax after sixteen applications discouraged my further use of it in this case. Endeavoring to remove all possible infection from wounds before applying the wax film, I used a saturated solution of salicylic acid (watery solution), a method quite common preceding skin grafting. When the wound was sealed with wax, however, a puddle of pus would soon follow, and the abundant moisture would seem to delay the healing. Cultures showed this yellowish exudate to contain staphylococci in all cultures taken.

THIRD DEGREE BURNS

In observing third degree burns, I have never seen a burn the size of a dime heal in less than six weeks' treatment by any other method than skin grafting. It often takes from three to five weeks to determine whether or not a burn is going to be a third degree burn. Under compress dressings the deep skin will struggle for life. About the time the wounded derma looks as though it was going to come to life, it apparently breaks down over night and sloughs off — a liquefaction necrosis. Often the wound is charred — carbonized — and will remain so for a couple of weeks before it begins to slough. Then it will be a week or ten days in sloughing before it is suitable for skin grafting. It is impossible to skin graft a wound while the patient is working. Zonas silk smeared with scarlet red will help, but nothing in my hands has completed the healing under the time mentioned above.

CASE 9.—A submalleolus burn the size of a dollar was dressed for four weeks by compress, when ready for skin grafting. The wax filament was used for thirty consecutive days. Exuberant granulation appears to be a great factor under the wax treatment. The granulations became so pronounced in this case that they had to be trimmed down every four or five days. The epithelium did well for a few days, but when the wound got to the size of a quarter it became so sluggish that I resorted to picric acid gauze. This soon caused a dry scab to form under which epithelization was completed in twenty-five days more, making twelve weeks for the entire healing of this wound. A similar wound took thirteen weeks to heel under scarlet red.

CASE 10.—A carbuncle crater the size of a quarter on the shoulder, filled with granulating tissue, was treated thirty days with wax, but discontinued thereafter and completed under picric acid gauze.

CASE 11.—A granulating wound on the inner side of the leg over the middle third of the right tibia, arising from an open incision for an abscess, demonstrated no improvement whatever after thirty applications of wax, although the wound looked ripe for skin grafting when the wax treatment was commenced. This patient was then sent to the hospital and treated by skin grafts.

Out of twenty-three cases of third degree burns, I have not been able to heal one with the wax paraffin treatment. After from twenty to thirty applications of the wax I had to resort to the aseptic scab produced by picric acid gauze or scarlet red on oil silk, or boric acid compress. The formula given by Dr. Powers is: white wax, 3½ parts; paraffin, 3½ parts; resin, ½ part. This works well applied with a cotton applicator or small varnish brush, but is too dry to apply with an atomizer. The proprietary preparations which seem to carry more paraffin seem to work better with the atomizer. The technic of application was to render the burn as clean as possible, remove all epithelium, glaze the wound dry with the warm air blower, or use a Politzer bag over an alcohol flame or fan the wound until it was perfectly dry. The wax was then applied at about 130 F. either through the sprayer or with a camel's hair brush. When a thick coating covers the wound, fine filaments of absorbent cotton are pasted on until the entire wax is covered. With the spray this is tedious, so we first sprayed the wound to save traumatism, then used the brush to apply the cotton over the partially cooled wax, and then covered it all with gauze and bandage.

DISADVANTAGES

1. An infected wound is covered with a sealed dressing.
2. There is a copious seropurulent exudate in every dressing removed.
3. We have no way of controlling the temperature of the wax. Taken from the boiling water at 212 F., it is too hot. Cooling at 114, it is too cold. The degree of pain caused the patient is the only means one has of knowing if it is too hot, unless one tries it first on the back of the hand.
4. Around the skin edges it is painful.

ADVANTAGES

1. In certain types of second degree burns it is about as good as any other dressing.
2. It keeps dirt and sweat out of the wound.
3. It is a great producer of exuberant granulations.

CONCLUSIONS

I regret that I cannot accomplish results said to be attained by other clinicians in third degree burns. Growing skin over night, or growing it by wholesale, which were the topics on the subject I read about in certain popular magazines, has not been my experience.

I believe the wax film is a good addition to the various methods for treating certain denuded surfaces and burns, but not a cure for all types of injury.

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EXTERNAL URETHROTOMY AND SEMINAL VESICULOTOMY

COMBINED IN A SINGLE OPERATIVE PROCEDURE *

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In an extensive and continuous personal experience with seminal vesiculotomy dating since 1901, complicating surgical conditions have naturally many times been encountered which tend to render the operation difficult, and in the class of cases now to be considered, existing complications were such as formerly either to bar me from performing vesiculotomy or else to force me to undertake that procedure only as a late sequel to other surgery. In early articles bearing on the surgery of the seminal vesicles, I have been careful to emphasize that it is often necessary to resort to catheterization in the after-treatment, and that consequently the urethra should be explored before operation to determine that no obstruction to the passage of a catheter exists. In cases in which catheterization has not seemed feasible, I later advocated opening the floor of the bladder between the seminal vesicles for introduction and retention of a catheter to drain the bladder. In 1910 I called attention[1] to this procedure and the uses to which it could be put. Postprostatic cystotomy does not contemplate a repair or correction of an existing urethral lesion. It simply serves as a means of avoiding the passage along the urethra of an instrument during the few days subsequent to a seminal vesiculotomy when such instrumentation may be called for to relieve retention.

The class of cases to be here considered are those in which a severe lesion of the seminal vesicles coexists with marked disorganization of the deep urethra. Acute or chronic systemic sepsis is the resulting complication which most frequently forces the surgeon to prompt action in these cases, though retention of urine, complete or partial, may be the impelling cause. Hitherto when the surgeon has been forced to act in this connection, his object, as a rule, has been simply to establish free urinary drainage, thus partially relieving the patient for the time being. This palliative surgery may save life and by so doing allow the patient to drift back into a state of invalidism. The reason for this is that not all septic foci are thereby eliminated.

My former method of dealing with these cases was by resort to two or perhaps more separate surgical procedures. In case of acute retention combined with acute sepsis, the perineum would be opened freely and also a suprapubic vesical opening might be made, should free urinary drainage not be otherwise assured. In such a case two other subsequent operations would probably be demanded to insure complete recovery, namely, seminal vesiculotomy and a repair operation in connection with the urethral lesion. In cases in which the urethral obstruction was not complete and the sepsis not of a grade of extreme severity, I often performed first a seminal vesiculotomy combined with postprostatic cystotomy, and then later as a second operation external urethrotomy and a repair of the urethral lesion.

There were various objections to treating these cases by multiple operations, aside from the chief one already mentioned of the failure promptly to eliminate all septic foci. Such failure materially increased the risk as regards mortality, and besides this, in a case still septic, surgical repair following a primary operation was slow and unsatisfactory, inviting persistent fistula in connection with urinary drainage and nonunion where plastic repair work had been attempted. When a patient has been through a severe illness and a surgical ordeal, it is often difficult to get him to consent to necessary supplemental operations in the near future, or at least I have so found it, a result being that the patient may finally leave the hospital still suffering, generally dissatisfied with what has been done for him, and strongly inclined to seek other surgical advice. On several occasions I found a second operation demanded as an emergency measure before convalescence had been established following a primary procedure. This occurred mostly in cases in which inflammatory exudation about a deep urethral lesion increased rather than diminished after the bladder had been drained through a postprostatic cystotomy. In the majority of instances, when the passage of the urine is diverted from the urethra, improvement follows in connection with the inflammatory status of a urethral lesion; but in these minority instances the exudation increased sufficiently to block the urethra, thus causing retention as soon as the postprostatic vesical opening closed. The development of such an emergency is objectionable from a surgical standpoint, and should be avoided if possible. These surgical objections were sufficient to lead me to treat cases of this description by one radical and combined surgical procedure undertaken as a single operation. My experience in so doing has been highly gratifying.

The combined operation cannot be performed by maintaining the body of the patient in one position on the operating table. One change is always required, and often a further change is desirable. In the latter cases, however, a further change consists simply of a shifting of the body back from the second position to the original first position in order the better to adjust drainage tubes and packing. My operative technic in connection with seminal vesiculotomy has already been fully reported.[2] The same can also be said regarding the surgery employed in connection with the deep urethra.[3] In the combined operation the patient is first placed in the knee-chest position for drainage of the seminal vesicles and of the adjacent postprostatic extravesical region, provided such area has become involved. After gauze packing has been adjusted, the patient is then turned into the lithotomy position, the perineum incised by a free median incision, the deep urethra opened, and the neck of the bladder freely incised. The next step of the operation is to treat or repair the existing lesion of this part. This may call for urethral resection, the elimination of urethral false passages, the drainage of areas of suppuration, etc. The maintenance of perineal vesical drainage by the insertion of a rubber tube is always a feature of this operation. When active suppuration is present it may be necessary to leave the perineal wound open and packed with gauze; otherwise it is often feasible after

* Read before the Section on Genito-Urinary Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Fuller, Eugene: Post-Prostatic Cystotomy, Med. Rec., New York, Oct. 22, 1910.

2. Fuller, Eugene: Extraperitoneal Rupture of the Bladder: Its Surgical Management, THE JOURNAL A. M. A., Dec. 12, 1914, p. 2114; Drainage of Extravesical and Extraperitoneal Suppuration of the Male Pelvis, Oct. 25, 1902, p. 1021; Med. Rec., New York, 1913, **84**, 691.

3. Fuller, Eugene: Med. Rec., New York, April 2, 1910.

repairing or eliminating lesions to close the perineum with the exception of the opening left for the passage of the vesical drainage tube. When the perineum is closed, it is often necessary to maintain in the urethra a drainage tube to act as a splint as described in my article[3] already referred to in dealing with the surgery of the deep urethra. Aside from those, there are two tubes necessary in connection with the seminal vesiculotomy. All packing and sutures are removed at the end of five days, and the tubes generally at the end of ten days after operation. In order to illustrate and to make clear the necessary field for this combined surgical operation, the clinical history of a few cases will be recited.

REPORT OF CASES

CASE 1.—A man, aged 36, entered the City Hospital with retention and in a septic condition. He had been well until about a month before, when he contracted his first gonorrhea. Examination revealed bulging periurethral abscess just anterior to the penile scrotal junction. The perineum was swollen, brawny, and tender to the touch, evidencing deep suppuration also in that region. Rectal exploration revealed great tumefaction, tenderness and heat, involving the entire postprostatic area. It seemed plain that there were three independent foci of active suppuration, and that thorough drainage of these together with the bladder were promptly demanded to save life. The patient was put in the knee-chest position. The seminal vesicles were opened together with the periseminal vesicular tissues. About 4 ounces of pus were liberated. The patient was then put in the lithotomy position and the perineum opened freely. A large amount of pus was liberated by this incision. After the bladder had been opened for drainage, this region was packed. The periurethral abscess was next opened by an incision through the urethral floor. This thorough procedure combated the systemic sepsis. The patient left the hospital in a very satisfactory condition.

CASE 2.—A man, aged 45, entered the City Hospital chronically septic and so rheumatic that he walked with great difficulty. Both ankles were tumefied red and very tender to the touch. There was hardly any control of urination, and there was much frequent vesical tenesmus. Control of the bowels was uncertain. There was more or less continuous rise of temperature. The patient had been strong and vigorous till about three years previously, when he contracted gonorrhea. The history was that retention followed, and that the bladder had been opened and drained by way of the perineum, leaving the patient in the present condition. Examination revealed considerable scar tissue in the perineum and some induration. Manual examination through the rectum revealed the entire postprostatic space filled with indurated tissue which completely enveloped the seminal vesicles, extending forward into the prostatic capsule and laterally to the borders of the pelvic space. This extensive lesion involved the trigonum, causing marked pericystitis. There was disorganization of the deep urethra, it being difficult to pass an instrument into the bladder owing to a sulcus or pouch on the floor and just anterior to the prostate. The seminal vesicles were opened and free dissection made into the surrounding tissues. The perineum was then opened, the sulcus dissected out, and the prostatic fibers encircling the vesical neck cut through, this incision being extended backward so as to include the anterior portion of the trigonum, which was also involved. The patient made an extremely satisfactory recovery. All the septic and inflammatory conditions disappeared, together with the pericystitis. He left the hospital comfortable and with good control of the bladder.

CASE 3.—A man, aged 38, entered the City Hospital with difficult, frequent and very painful urination. At times the urgency was so great as to occasion persisting vesical tenesmus. Chills and fever were prominent symptoms. There were marked perineal pain and general distress referable to the pelvic, sacral and hypogastric regions. There was a history of early gonorrheas and urethral stricture. There had been much urethral instrumentation, and on two occasions there had been perineal operations for stricture. Each operation had apparently served to increase the symptoms of discomfort, and for a long time past it had seemingly been impossible to pass instruments into the bladder. Instruments passed along the urethra were deflected into one or more false passages. There was much induration in the perineum. Rectal examination revealed extensive hard cicatricial involvement of the prostate and seminal vesicles. Such involvement also included all the postprostatic fibrous structures, indicating that formerly there had been extensive suppuration in this region. An attempt to repair the urethra by operation, neglecting the lesion involving the seminal vesicles, would, it then seemed to me, invite another failure. Accordingly seminal vesiculotomy was first performed, and then the perineum was opened, the urethra partially resected, the false passages eliminated, and the rigid contracted neck of the bladder cut through. The patient made such a complete recovery that he left for France, expecting active military service.

CASE 4.—This patient was a man, aged 70, whose chief symptoms were severe perineal pain often involving the rectal region. During periods of exacerbation, the pains would radiate down the thighs and into the hypogastric and sacral regions. Urination was difficult and frequent. The stream was slow to start and lacking in force. On several occasions retention had occurred, necessitating the passage of a catheter. There was no urethral obstruction. The bladder was considerably contracted, any distention over 6 ounces causing great pain. Aside from an old chronic streptococcus infection, the urine showed nothing abnormal. The present symptoms had commenced twenty-five years previously. As a young man he once had gonorrhea. The senior Otis had operated on the patient's anterior urethra many years before, but nothing that had ever been done for him had apparently resulted in relief. There had been a frequent resort to opiates, and when he came to me the drug habit in a moderate degree was established. Years ago there had been considerable discomfort from priapism, and sexual indulgence had then increased his discomfort. For years there had been no such indulgence. There was no tuberculous history. Rectal examination revealed the prostate atrophic and very sclerous. The seminal vesicles were tumefied, very sclerous, and so sensitive to the touch that the patient cried out with pain, asserting that therein lay the seat of his pain and discomfort. There was marked rigidity and contraction of the prostatic neck of the bladder. A bougie à boule could be easily passed into the bladder, but its extraction was difficult, as the shoulder of the instrument caught and was held by the contraction. Cystoscopic examination revealed the bladder trabeculated. The surgical indications were to open the seminal vesicles and to cut through the contracted prostatic neck of the bladder. When the seminal vesicles were opened, numerous small calculi were found in each to account for the extreme pain and sensitiveness. Next the perineum was opened, the vesical neck incised, and a tube inserted into the bladder. The structures making up the rectal wall were thin and atrophic; and this, in view of the age of the patient, caused me to make a counter suprapubic vesical opening to insure especially free drainage, and the more to guard against postoperative tenesmus. I had a fear that sloughing of the rectal wall might result should there be unnecessary tenesmus following the operation. The operation was highly successful, the patient leaving the hospital free from pain, and voiding urine without obstruction.

COMMENT

My present experience with this combined surgical procedure is confined to ten cases, in nine of which the patients recovered satisfactorily. The one who died was septic before operation, owing to streptococcus involvement of both seminal vesicles. Aside from this, some prostatic hypertrophy had to be removed when a contracted vesical neck was incised. In this

case, on the seventh day after operation, when convalescence was seemingly established, persistent hemorrhages occurred, suggestive of hemophilia. The patient died about one week after the occurrence of the first hemorrhage, horse serum and thyroid having no seeming effect.

ABSTRACT OF DISCUSSION

Dr. E. O. Smith, Cincinnati: We are all familiar with Dr. Fuller's work on the seminal vesicles and his particular method of perineal drainage with the urethral splint. I have used this method, but not in this particular group of cases. It was in cases in which there were persistent fistulas that could not be closed otherwise, and in which there was no particular inflammation of the vesicles. I can readily understand how this method would be very valuable in the class of cases presented by Dr. Fuller. Of course, we do not see a great many cases that have three foci of infection at one time, but it is purely a matter of common sense to open all the sources of infection. The simple opening of the perineum in the particular case reported would not have given the patient relief, because the seminal vesicles were also foci of infection.

Dr. R. H. Gibbons, New York: I am glad to know that Dr. Fuller has added external perineal urethrotomy to his theretofore most successful operation of vesiculotomy. A young man contracted gonorrhea. His family physician treated him. He told the patient to take plenty of water, plenty of milk, no stimulants, no tobacco, etc., and no injections, and in due time he got well, apparently. Later he contracted another infection. He then went to a general surgeon who used sounds, etc., and still the discharge kept up. Then he went to a general practitioner, who instilled silver nitrate into his deep urethra and cleared up his discharge in five to ten days. Then he began to have distress and suffering, and became wretched and miserable. He had boils here and there, so-called abscesses, and eventually he went to Eiselsberg's famous clinic in Vienna, where he was subjected to various tests, and Eiselsberg told him he did not know what the trouble was, but thought there was a piece of bone in his rectum. He had an abscess in his rectum. A prominent genito-urinary man in New York saw him repeatedly, and many Wassermann tests were made, with a diagnosis of syphilis. Finally another general surgeon found a tumor and cut into it. He then came into my hands. I made an examination and thought he had sacro-iliac disease, but the next day I changed my mind and thought it was all due to a vesiculitis, and asked him to go to Dr. Fuller, which he did not do for some time. In Chicago another surgeon examined him, and said: "Young man, you've got tuberculosis, and you've got to go away to live out of this country; go where there is plenty of sunshine." He came back to New York and told me what this gentleman had said. I called in Dr. Virgil P. Gibney, who convinced him that he had no such trouble. I then had him see Dr. Fuller. He was fairly well then and Fuller advised him to wait a year. At the end of a year Dr. Fuller dissected out the vesicles. If that operation had been done at the opportune time all this misery, suffering and suspense would have been saved. The patient got well, except that he had a peritonsillar infection, which I attributed to the trouble in the genito-urinary tract. The tonsils were removed.

Dr. Eugene Fuller, New York: This paper deals with a method which has not hitherto been described. I put it on record as an efficient method of dealing with a class of cases which had not received curative attention, as I think you will agree if you are in institutions where you get hold of such patients as we do at the City Hospital. Many patients are sent there with the expectation that they are surgical lemons, but in reality they are the very best cases to tackle, because to get results one has to do something a little better than the preceding fellows. Many of the cases under consideration have been straightened out; most of the patients had gone the rounds of the best hospitals and had fetched up at the City Hospital as the last resort. One of them is now doing his bit fighting at the front.

When I first employed this procedure I felt that opening the seminal vesicles and then the deep urethra, at the same time splitting the prostatic neck into the trigonum, looked radical, and it is radical. You hear men say, "That is too radical," and perhaps that "he is a butcher," etc., but I think that sort of comment is rather a compliment to a man than otherwise if his patients get well. I hope the gentlemen of the section will try to manage these cases along this line, and not be afraid of the free openings any more than one need be afraid of the free opening of an abscess.

The case that Dr. Gibbons spoke about was extremely interesting, because that man had, primarily, suppuration in connection with his seminal vesicles, and this suppuration had seeped its way through the bony structure of the back above the sacrum and had pointed outside. I had never before seen such suppuration so pointing. A dorsal incision had previously been made and a piece of the sacrum had been chiseled out, on the assumption that the bony structure was the primary seat of the disease. In the performance of seminal vesiculotomy in this case I found certainly over an inch of dense fibrous tissue to be incised before reaching the focus of the seminal vesicle abscess. We drained it—that was several years ago—and I feel that I did not drain it sufficiently long as the man was slow in getting well. I think in a case like that in which the abscess walls were so thick, it would be well to keep the drainage tube in for a couple of months rather than the customary ten days.

ABSORBABLE METAL CLIPS AS SUBSTITUTES FOR LIGATURES AND DEEP SUTURES IN WOUND CLOSURE *

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CHICAGO

Metallic clips can be inserted much more quickly than any suture. They are also more rapid than stitches for closing deep layers and bleeding vessels but would, of course, leave the wounds full of small foreign bodies unless some absorbable metal could be used. I have been trying various metals and alloys with a view to finding those most absorbable, hoping to combine the good qualities of the animal ligature with the strength and speed of the metal clip, clamps and staples.

A large part of the time required for any operation is that used in tying ligatures and in deep suturing. In some operations this amounts to 80 or 90 per cent. of the whole time spent. If we make a "study of efficency" in wound closure we see at once that there is a great deal of lost motion in first seizing and subsequently tying large numbers of vessels. Could not these two acts be made one? If each artery forceps carried its own clip or circlet so as to leave behind a tightly closed vessel when removed, wound hemostasis would be much simplified and shortened. The more numerous the forceps required and the more inaccessible the location, the more advantageous are the clips by comparison.

Harvey Cushing has advocated small silver clips for closing little vessels in brain surgery. Their advantage over heavy forceps or needle and thread is obvious in delicate structures which do not bear rough handling. Almost the same advantages are apparent in operations in other parts of the body. Not only for

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ligatures, but as a substitute for deep sutures, clips have the advantage in speed and security. The deep suture forceps recently described by me enables the operator to place stitches rapidly in any deep location, but even this requires the tying of knots which is less speedy than the placing of clips. Sometimes the safety and rapidity of the old-fashioned Michel "agraffes" has tempted me to use them in deep wounds at the cost of leaving foreign body, just as certain operators practice leaving hemostatic clamps in deep wounds a few days instead of hemostatic ligatures. In using clips I have attached to them strong cords or fine chains which were left hanging from the wound for drainage and to secure easy removal. The pendant cords or chains are useful drains in nearly all such cases and will bring out the adherent clips in eight or ten days.

A little experience with using clip forceps rather than common hemostats will convince any operator that this surgical wrinkle combines two important steps into one. If we seize every bleeding point with clip-carrying forceps instead of empty forceps, we seize and tie the artery in one motion. I was led to try this first in cadaver and in dog operations as a mode of speeding up and later in a considerable number of operations on man. I am convinced of its practical value both in deep ligating and deep suturing. To this method two objections are apparent.

1. Some small branches and some wrongly placed hemostats do not need ligatures.

2. Foreign bodies are left in the tissues.

To the first objection it may be said that our technic would be better if we had a routine of ligating *all* vessels however small, and that seizing wrong points could be avoided by care and practice. Bissell's recent work on fat embolism shows the importance of tying all veins as well as all arteries.

The second objection—that of leaving foreign bodies behind—is the occasion of this paper, which refers to my efforts to find an absorbable metal or alloy of metals which will disappear ultimately when buried in wounds.

An ideal absorbable metal is pure magnesium which, as shown by our experiments and as was known some time before, disappears rapidly in healthy tissue and leaves no irritant residue. But this metal is brittle and weak in small pieces.

In a series of animal and human operations I tested a variety of metals by implanting small pieces in living tissue and soon found that several common ones of low melting point were absorbed or disappeared with fair rapidity in aseptic wounds. Several of these—aluminum, zinc, cadmium—were tested carefully as to rate and time of absorption, and while the results seemed inconsistent, they prove a generally constant ratio of absorption for each metal tried when all the conditions were exactly equal.

LABORATORY RESEARCH ON ABSORBABLE METALS

The first work was done in the laboratories of the Morris Research Institute in a series of operations on dogs, with the assistance of Dr. Edmund Andrews, in 1915. The size, time and per cent. lost daily is shown in Table 1. The location chosen was usually the space between the rectus muscle and anterior or posterior rectus sheath.

These experiments show that the four metals tried last in the tissues from fourteen to 1,000 days. It is clear that these results are not consistent, since the ratio is not always the same with the same metal. This is especially marked in comparing the rate of absorption in large and small pieces. The 4 gm. piece of aluminum lost only 0.10 gm. in twenty-one days or 2.5 per cent., equaling about 0.1 of 1 per cent. per day, while the 0.12 gm. piece lost 0.025 gm. and almost 25 per cent. in fourteen days, or almost 3 per cent. per day, and a 0.10 gm. piece lost 0.030 in twenty-eight days, 30 per cent., or about 1 per cent. a day.

It would appear that the total absorption was dependent more on surface exposed than the weight of metal. Thin wires and sheets gave up as much material to absorption as large thick pieces of the same area. Also the inconsistencies shown by these tests are partly due to the greater power of some tissues to absorb metals as compared with others. It is my opinion also that good or poor repair in the wound and septic or aseptic healing has much to do with the course of absorption. Chemically it would seem that absorbable metals are those corroded by alkalies, such as aluminum, cadmium, zinc and magnesium. All absorption, however, is dependent on close vital contact with living cells and is retareded or prevented by the presence of wound secretion, especially pus.

TABLE 1.—TIMES OF ABSORPTION OF FOUR METALS

Dog No.	Metal Used	Weight, Gm.	Weight (Gm.) Removed			Per Cent. Absorbed	Per Cent. Absorbed One Day	Time for Total Absorption, Days
			After 14 Days	After 21 Days	After 28 Days			
1	Magnesium	0.07	0.016	.....	.....	77	5	20
2	Magnesium	0.05	0.000	.....	.....	100	7	14
3	Magnesium	0.45	0.000	.....	.....	100	7	14
4	Cadmium	0.70	0.70	.....	.....	0	0	
5	Cadmium	0.75	.....	0.321	.....	57	2	50
6	Cadmium	0.40	.....	.....	0.13	70	2.5	40
7	Zinc	0.14	0.076	.....	.....	52	3.5	30
8	Zinc	0.35	.....	0.304	.....	12	0.5	200
9	Zinc	0.15	.....	.....	0.121	20	0.8	167
10	Aluminum	0.12	0.075	.....	.....	40	3	33
11	Aluminum	4.00	.....	3.90	.....	2.5	0.1	1,000
12	Aluminum	0.10	.....	.....	.075	25	1	100

To make these results consistent we have only to repeat these experiments in large numbers and with uniform technic as to exact size and form of metal pieces tested. My work shows, however, a definite ratio between various metals as to time of disappearance when pieces of equal size are similarly implanted in living tissue. Magnesium again proved the most rapid in disappearance, as it is the most benign and innocent in all its salts and oxids. Aluminum apparently is slightly more soluble in the body than zinc or cadmium, but all three are capable of disappearing in a few weeks' time when small pieces, say 0.01 gm. to 0.10 gm., are inserted. Bismuth absorbs very slowly, as do arsenic and antimony, but these metals lack toughness and malleability.

Other metals, silver, bronze, lead, nickel, steel, copper, etc., we know will remain unaltered except by slight tarnishing for indefinite periods in the living structures. This is also true of the amalgams of hard metals with mercury. Pure tin and lead are absorbed almost imperceptibly if at all. While pure magnesium is the quickest and safest of all metals to leave in living tissues, being rapidly absorbed and leaving no toxic residue, its physical properties, aside from its extreme lightness, do not recommend it for ligature, clips, or any use demanding tensile strength. Magnesium wire and ribbon cannot be tied even in loose

knots, as it breaks immediately on kinking. It cannot be twisted even loosely without showing its brittle nature. It is true it can be made into solid rings and bobbins and buttons. Intestinal buttons made of it will disappear by absorption or oxidation if not passed, as will pins and intramedullary cylinders in bones. Lespinasse has used cylinders or rings of pure magnesium for blood vessel anastomosis. L. L. McArthur on theoretical grounds suggested some years ago that various alloys be tried of magnesium with stronger metals so as to combine absorbability with toughness. His suggestion was not acted on practically at that time.

The animal experiments above tabulated I made the basis of observations given in Table 2.

TABLE 2.—THE RANK OF THE VARIOUS METALS

Absorbability	Tensil Strength	Maleability and Flexibility
1. Magnesium	1. Aluminum	1. Zinc
2. Cadmium	2. Cadmium	2. Cadmium
3. Zinc	3. Zinc	3. Aluminum
4. Aluminum	4. Magnesium	4. Magnesium

It would appear certain that each of these metals possesses a superiority in some factors and all have a softness and absence of spring temper which is desirable. It is this soft yielding quality which makes pure silver wire so much superior to bronze or steel in wire suturing, and which gives the German silver skin clips their power of remaining set. Any metal with springy elacticity refuses to be molded into place and hold its shape, so as to hold well. One of the strongest known wires is the aluminum bronze recommended by Dr. M. L. Harris for sutures. This has vastly more tensile strength than pure silver or pure iron wire of the same size, but I have never found it anything but vexatious because of its high modulus of elasticity and spring temper.

We were reduced to the half dozen metals of the soft consistence, rapid corrosion and low melting point, and evidently could get the qualities needed only by some alloy or combination. Alloys do not always have the combined qualities of their ingredients so that some experiments were made by alloying magnesium with the several other absorbable metals to get a union of good qualities.

My idea was that the nearest alloy to pure magnesium which would be as flexible as, say, sheet cadmium, zinc or aluminum and could be knotted without breaking would be best.

The mixtures first tried were: Magnesium and aluminum, equal parts; magnesium and cadmium, equal parts; magnesium and zinc, equal parts. These were all of a pasty consistence like soft solder when half melted and had all the bad properties we wished to avoid. They were hard, brittle and without tensile strength. One mixture, magnesium 25, zinc 35, aluminum 40 per cent., was so brittle it could be powdered in a mortar. Doubtless annealing and rolling would improve these metals, but no mixture we have had made equals aluminum or cadminum in toughness or zinc in soft malleable temper.

So far my efforts to alloy magnesium with either of these metals have not given the qualities I sought, many of the mixtures tried lacking in ductility, flexibility and toughness. Some alloys are now being prepared which I hope to find more suitable by preventing oxidation during the mixing.

Ordinary surgical clips or imported (Michel "agraffes") and the form of horse-shoe and clam-shell clips, described by me in a previous paper, are made of the alloy known as German silver. It has exactly the right qualities mechanically for this work. These clips lock firmly wherever placed by their own property of inelastic "setting."

I find absorbable metals of the kind above mentioned, I mean aluminum, cadmium and zinc, to work equally well for buried clips. Buried wire staples and little clamps or clips disappear in the tissues in a few weeks if small and light.

For larger work bone plates, intermedullary pegs, nails and screws, magnesium answers well and disappears in one or two months, especially if perforated or fenestrated and made as thin as possible. It has nothing like the strength of steel for Lane plates, but compares favorably with ivory or bone pegs for placing in the shafts, pegging the head of long bones.

Pure aluminum wire and commercial alloys are especially good if made into cables and used to sew fascia and deep muscles. Here it has no striking advantage over a perfect animal ligature except that it is rapidly and certainly made sterile by boiling. Alkalies must not be added to solutions for boiling aluminum or zinc, as they dissolve it rapidly.

The tiny absorbable metal clips and staples are a great gain in many operations. If we seize all bleeding points at first with clip bearing forceps we may put on a few unnecessary ones, but clearing the field at once of dangling hemostats is a great saving of time and I think a surer method than tying ligatures. I never saw in any clinic full immunity from knots and ligatures occasionally slipping. The same may be said of the sac of a hernia, the stump of an appendix or fallopian tube or the neck and vessels of the cystic duct.

Closure of deep wound layers is less easy than individual pedicles but shows an equal gain in speed over suture. The inner layer of an intestinal anastomosis is very rapidly made by a row of clips. In the lumen of the bowel these need not be absorbable, as they fall into the canal later. With the horse-shoe clip the parts are held in apposition by a clamping action as by the Murphy button. For fascial wound layers the metal must be absorbable. Here wound closure is much more rapid than by needle or thread. For obliterating varices and angiomas they are also more speedy and bloodless. For fixation of certain movable viscera, nephropexy, gastroplication, omental fixation, as in Talma's operation, or various suspensions of prolapsed organs, absorbable metal staples and clips are quite easy and rapid of application. This is also true of ligations in continuity of veins or arteries with or without resections of their trunks. When as a factor of safety two or more ligatures are desired on one vessel, time lost is much less with clips than with ligatures. This applies to operations on aneurysms or large varices or to all large vessels, as the thyroid vessels in lobectomy or the carotid artery when tied for any reason.

On the whole I have been more than satisfied so far as we have applied the metal fasteners in our work, and I can see many useful applications not yet fully tested.

CONCLUSIONS

1. Speed and safety of hemostasis is much improved by using metal clips.

2. If of absorbable metal or alloy they do not act permanently as foreign bodies. If of ordinary metal,

they should be attached to cords or chains and later drawn out.

3. Several pure metals are absorbable, but have not quite ideal physical qualities.

4. Efforts to make ideal alloy are encouraging but not yet wholly successful.

5. Other appliances — plates, screws, buttons, bone splints, and wire sutures can also be made of absorbable alloys when perfected.

A STUDY OF ONE HUNDRED SELECTED CASES OF PITUITARY DISEASE*

ISADOR ABRAHAMSON, M.D.
AND
HYMAN CLIMENKO, M.D.
NEW YORK

The ductless glands with their important influence on the growth, development and maintenance of the body, physical and mental, occupy a notable position in the realm of medicine today, yet a few generations ago they were wholly neglected and almost unknown.

About the middle of the last century Claude Bernard, Brown-Séquard and others popularized their use in therapy; but the suggestions offered by them were not followed up, and the value of the work then accomplished was largely forgotten. Langley and Gaskell in England, Beedl in Vienna, and Bouchard in France have in recent years vastly increased our knowledge of the action of these glands. On the facts these observers have discovered, a complete system of therapy has been erected and generalizations regarding their influence in disease have been recklessly enunciated as dogmas. Coincidence became confused with causation.

As clinicians add to our store of facts, the skepticism of the validity of these dogmas daily increases. Indeed, we are now in danger, perhaps, of a reaction in which we shall tend not to overestimate but rather to underrate and despise the power of glandular therapy. This tendency is dangerous to progress, and we must counteract it by judicially weighing all theories and by accepting none which are not adequately substantiated. Yet our attitude must not be merely passive. We must patiently strive to gain further knowledge to replace unverified belief in glandular activity; we must patiently add to our store of facts concerning the powers of glandular products and then await the day when a medical Newton will justly correlate these facts and enunciate for us the laws which control them.

OBSERVATIONS IN SELECTED CASES

In this spirit we have studied a hundred selected cases of pituitary involvement which have come under our observation within the last sixteen years. One or the other of us has personally studied each of these hundred cases: forty cases of acromegaly, fifty of hypopituitarism, forty-five dwarfs and one giant. The clinical and other details of this study we shall later publish. Among the symptoms of pituitary disease, such as adiposity, bony changes, sugar tolerance, polyuria and sexual manifestations, we wish, at this time, to discuss only two, namely, sugar tolerance and polyuria.

SUGAR TOLERANCE

Cushing and others maintain that disease of the posterior and intermediate lobes of the pituitary affects carbohydrate metabolism. Cushing reported, in advanced pituitary disease a marked increase in the sugar tolerance. He states that in hyperpituitary conditions sugar tolerance is decreased, in hypopituitary conditions sugar tolerance is increased. Cushing dealt entirely with alimentary glycosuria. Vigevano, from his experiments on dogs, concluded that the entire gland had a greater antiglycosuric effect than had the posterior lobe alone. Blumenthal demonstrated that the rate of sugar absorption by the alimentary canal was inconstant, and Woodyatt and other investigators that a similar lack of uniformity characterized the rate of absorption of sugar introduced intravenously.

The sugar tolerance is determined by the ratio of sugar absorption to sugar utilization. Woodyatt and his co-workers found that, when the sugar absorption was not in excess of the sugar utilization, pituitary conditions, such as acromegaly, gigantism and genital dystrophy, did not influence the sugar tolerance. The results obtained by Cushing, therefore, depended on the inconstant sugar absorbability, via the intestinal mucosa, and not on any change in sugar metabolism which pituitary conditions cause. An alimentary sugar tolerance similar to that described by Cushing may be found not only in myxedema and other morbid states but even in normal subjects, as our studies conclusively demonstrate. In a series of brewers who daily consumed enormous quantities of beer, we never found sugar in the urine, although we tested them repeatedly. We have given large quantities of sugar daily to a number of persons. To the same large dose some reacted with glycosuria, whereas others did not. In pituitary cases, the results of our experiments were as inconstant as with normal individuals.

A study of thirty cases revealed that four patients had diabetes; all of them were of the hypopituitary type; one of them was a dwarf; five had a high sugar tolerance; of these, three were of the hypopituitary type and two acromegalic. Twenty-one had a low sugar tolerance; of these, fourteen were acromegalics and seven were of the hypopituitary type. There is no constancy in the sugar tolerance manifested in these conditions.

No physiologic basis exists for attributing a relationship between the pituitary gland and sugar tolerance. We have, moreover, an absence of clinical basis for this alleged relationship. Sugar tolerance, therefore, must be discarded as a pathognomonic sign of pituitary disease.

POLYURIA

If there is excess of water in the blood, the hemoglobin percentage is low. If there is a diminution in the fluidity of the blood, the hemoglobin percentage is high. Haldane and Priestley used the hemoglobin percentage as a guide in their investigation of the excretion of water from the blood through the kidneys; they gave to men copious drafts of water, and found that they did not thereby affect the hemoglobin percentage. They exposed other men to prolonged sweating and found that the hemoglobin percentage was still uninfluenced. There is, therefore, some mechanism which tends to maintain a uniformity in the concentration of the blood. A fixed relation exists, therefore, between blood concentration and diuresis.

* Read before the Section on Nervous and Mental Diseases at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

Excessive diuresis in those who imbibed much water, and scanty diuresis in those who were sweated were in both instances accompanied by a persistence of the hemoglobin percentage at a constant normal level. As the urine is not a mere filtrate, any changes which may have occurred in the blood during these experiments were of an imperceptible degree. Haldane and Priestley concluded that the variations in the diuresis produced by imbibing water and by sweating were not dependent on alterations in the dilution or concentration of the blood.

They next used salt solutions instead of water, and found that when the salt solution was hypotonic or hypertonic before absorption, salts in the economy were added or subtracted by the tissues to produce isotonic solutions. When salts were added by the tissues, the electrical conductivity of the blood was reduced. When subtracted it was increased. The increased diuresis resulted when these changes tended to produce an increase in the blood volume. Diuresis follows only when both water and salt are relatively in excess to the other constituents of the blood. While this excess prevails, the hemoglobin percentage falls; when it ceases to prevail, the hemoglobin percentage returns to normal. So delicate is the mechanism that the first hint of excess brings about diuresis, which continues at a rate that strives to keep the hemoglobin percentage normal. Hence the change in the percentage is so slight as to be difficult to detect.

Schaefer, Matthews, Aschner, Cushing and others have shown that lesions of the posterior portion of the pituitary gland are accompanied by polyuria. Motzfeld, Bab and Maranon have further demonstrated that such polyuria can be checked by administration of the extract of the posterior and intermediate portion of the pituitary gland. This check is exerted independent of blood pressure changes and of intestinal absorption. Motzfeld believes that the check is due to the action of the pituitary substance on the sympathetic, but others, including ourselves, disagree with him.

Dr. W. M. Kraus has undertaken to distinguish a rarity of polyuria in hypopituitary conditions and a frequency in hyperpituitary conditions which we have been unable to confirm. From the physiologic manifestations just mentioned, from the pathologic researches of Maranon and others, and from clinicopathologic reports by Boyd, Newmark, Maranon, Bab and others, including our own cases, there is no doubt that the pituitary gland has a powerful influence on the salt content of the blood and hence on its volume. From our own work we conclude that the results of this action on the blood volume may be three:

1. In cases in which there is no renal insufficiency, polyuria.
2. In cases in which there is renal insufficiency of a mild grade, polyuria and edema.
3. In cases in which there is marked renal insufficiency, hydremia and general edema without polyuria.

CONCLUSIONS

The posterior and middle lobes of the pituitary gland secrete a substance or substances which have, according to our observations, the following among other properties:

1. It does not influence sugar metabolism (sugar tolerance is not a sign characteristic of pituitary disease).
2. It controls the salt content on which the electrical conductivity of the blood depends.
3. This control is not exercised through the nervous system.
4. Disease of the posterior and intermediate portion of the pituitary gland disturbs the fixed ratio of the salt content of the blood which the secretion or secretions of that gland normally maintain.
5. Slight disturbance in the control induces alteration in the salt content of the blood and leads to polyuria, if there is renal sufficiency, or to a water logging of the tissues, if there is renal insufficiency.

129 East Sixty-Ninth Street—252 East Broadway.

ABSTRACT OF DISCUSSION

Dr. Walter Timme, New York: Dr. Abrahamson endeavors to simplify the pituitary abnormalities by dividing pituitary diseases into two great classes—hypopituitarism and hyperpituitarism. However praiseworthy such an attempt may be, it is not in accordance with the conditions. A pituitary gland may have an enlarged anterior lobe with corresponding small posterior lobe; therefore neither term, hypopituitarism nor hyperpituitarism, is applicable without expressing the limitation to the particular lobe in question. Again, hyperplasia of the posterior lobe, for instance, may be actually the cause of deficiency in function of the posterior lobe; the terms, therefore, hypopituitary and hyperpituitary, if not qualified, ought to be eliminated from discussion of the pituitary body.

As far as Dr. Abrahamson's remarks regarding polyuria are concerned, they are beyond criticism when applied to hyperfunction of the posterior lobe. One additional statement may not be amiss, however. It is that the effect of suprarenal gland on the blood plasma is to diminish its water content, which secondarily also produces a somewhat increased urinary output. It is difficult to distinguish always, therefore, whether the underlying cause of polyuria is pituitary or suprarenal in origin. That there is no interdependence of glycosuria and pituitary disease, I question seriously. One must distinguish the various types of glycosuria. Those dependent on real, acute pancreatic disease—pancreatitis or pancreatic new growths—show no involvement of the pituitary; but other types do show such changes. Fry, in the *Quarterly Journal of Medicine* (London) reported changes in the pituitary gland in diabetes. One clinical fact alone stands out to controvert the position of Dr. Abrahamson. It is that where pituitary gland is administered directly after meals in some sugar-free individuals, sugar appears in the urine; and if sugar had originally been present, it is increased thereby. It is therefore important to give pituitary gland at least one hour after meals. The reason assigned for this fact is that pituitary and pancreas are mutually antagonistic. The physiologists have never been able to prove this. A proper classification of pituitary disturbances must embrace each lobe individually.

Dr. D. I. Wolfstein, Cincinnati: The relation of the pituitary glands to polyuria, as brought out by the essayist, interests me. I have lately been treating one of the most marked cases of so-called diabetes insipidus. I know the term is rather obsolete. The patient was carefully studied, and the salt excretion and intake regulated. The only agent that had the slightest effect was pituitary extract given twice daily, under the skin; this did influence the amount of urine voided very materially. Will the essayist please try to throw some light on the treatment of this affection?

Dr. I. Abrahamson, New York.: The point raised by Dr. Wolfstein has been definitely settled by Bab. Patients suffering from polyuria were used to standardize the effectiveness of pituitary extracts. Polyuria was a better term than diabetes insipidus. A constant effect on the polyuria due to any cause could be expected after the administration, by hypodermic especially, of the extract of the posterior and intermediate lobes of the hypophysis. Confusion was the necessary result when we sought to explain contradictory results or phenomena by assuming two distinct and opposite morbid processes in the same case. One case cannot be held to be hyperpituitary with a dash of hypopituitary disease and

another the converse, simply because we could not explain certain manifestations except by some such stretch of imagination.

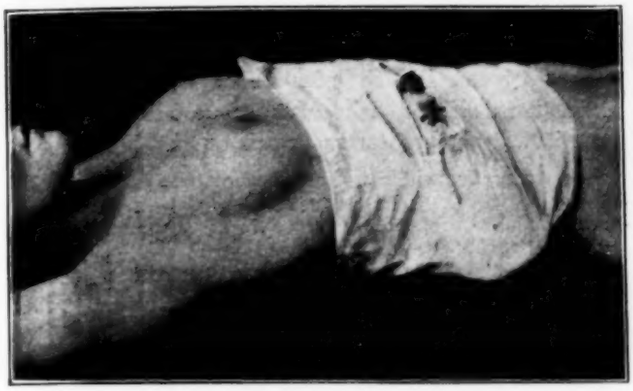
We must think along physiologic lines whenever possible, and explanations, to be convincing, must not be too strained. I therefore cannot agree with Dr. Timme's objections.

Clinical Notes, Suggestions, and New Instruments

GALLBLADDER BAND

ROBERT J. JAMES, M.D., SEATTLE

In the accompanying illustration is shown a gallbladder band which I devised, and which we have used in the hospital for the past two years with great satisfaction. The patient



Gallbladder band.

can turn and lie on either side without leakage of bile, and the bottle can be changed quickly and cleanly. These bands are washed and sterilized and kept ready for use. A small piece of tape is sewed on the edge of the pocket and tied around the neck of the bottle to keep it steady.

REPORT OF A CASE OF EXTREME FECAL IMPACTION

E. ARTHUR WATSON, M.D., GRAND ISLAND, NEB.

This case, I believe, is out of the ordinary and, as far as the literature to which I have access reveals, and in view of the age of the subject, unparalleled. The etiology I cannot explain without considering the possibility of congenital defects and lack of tone due to the condition of the bowel at birth.

History.—A girl, aged 13, American, born with an imperforate anus, the feces draining through the vagina, was operated on five years before I saw her, and the anus established at the normal location. In the absence of a sphincter, there had been incontinence. The anus was dilated several times in the two years following the operation, but there had been no trouble since that time. At one of the dilations the ampulla of the rectum was found loaded, and was cleaned out. The patient had not had the usual diseases of children. She had a severe attack of rheumatism last fall, and a fibrillated heart muscle since that time. Last fall the physician in attendance noticed a well defined mass in the abdomen, but did not have an opportunity of watching the patient, and did not see her again until two weeks before I did. At that time he advised that the patient be brought to the hospital, and he referred her to me.

Examination.—April 6, 1917, a tumor completely filled the abdomen. It was wedged between the ileum and behind the pubes so tightly that it was immovable. The fundus was well up in the epigastrium with another smaller mass extending from the fundus to the ensiform cartilage. Extreme constipation and tenesmus were complained of. A stool was procured daily, but was fluid or semifluid. The bladder could be felt well up on the anterior surface of the mass. There were albumin and an occasional cast in the urine, with an abundance of colon bacilli and some pus. The pulse was from 130 to 140, weak and intermittent. Attempts to pass the colon tube resulted in extreme pain and tenesmus. There was no fecal odor to the patient, nor was she troubled with gas. She was markedly cachectic. The leukocytes numbered 22,000. No red cell count was made, as a slide was negative. The appetite was poor.

Operation and Result.—A diagnosis of probable uterine fibroid was made, but operation was discouraged on account of the physical condition of the patient. After observing the patient for six days and watching the suffering, which had to be controlled constantly with opiates, I volunteered to operate if the parents so wished. The following morning the abdomen was opened and the tumor presented itself in the wound. The intestine was not visible, and the omentum lay over the anterior surface of the tumor. It was very frail, all the fat having been absorbed. The exploring fingers could not be forced around the mass in the pelvis on account of the tightness with which it was wedged. Exploration of the fundus revealed the colon entering the mass with a hard, well formed mass of impacted feces lying directly over the larger mass, and in the colon just before it entered the tumor. The smaller mass was about the size of a large lemon, and was the smaller mass which could be felt in the epigastrium before exploration. There were numerous blood vessels of large caliber over the entire mass. When the incision was enlarged, the mass could be slightly rotated, and the mesentery could be felt at the vertebral attachment. I then thought it was a tumor of the mesentery. The mass was hard and smooth, and not at all puttylike. An incision was made along the anterior surface of the mass, and an extremely thickened colonic wall was incised. The discovery was then made that the extremely distended descending colon was filled with hard, dry fecal matter. The intestine was incised for about 12 inches, and the contents lifted out. There were also present about 3 pounds of semisolid fecal material and the smaller mass already described. The entire descending colon from the splenic flexure to the second portion of the sigmoid was involved in the dilatation. The large, dry, mother mass weighed, one hour later, 5¾ pounds, and at least 3 pounds of smaller lumps and semisolid material were removed in all. The channel through which the stools had passed was along the posterior wall of the sac. The intestine was completely severed and both ends brought out on the abdominal wall, and an artificial anus established. About 5 inches of redundant intestine were dissected away from the lower extremity. We procured free purgation three days later, and the patient regained some of her appetite, but succumbed on the seventeenth day from exhaustion and emaciation. The heart did much better after operation than previously, but the kidneys continued to give trouble until the end, and were a factor in the termination of life.

Fecal impactions and section of intestine.

The accompanying illustration gives an idea of the firmness and contour of the mass. This was not a diverticulum in any sense of the word, and showed a simple dilatation. The section of intestine shows to some extent the extreme thickening of the wall which had taken place.

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SATURDAY, JULY 28, 1917

ADEQUATE RANK AND AUTHORITY FOR ARMY MEDICAL OFFICERS

No intelligent person, inside or outside the profession, is ignorant of the importance of medicine, both preventive and curative, in the world war now raging, on the final result of which depends the fate of many nations, including that of our own. In all the European countries engaged in this conflict, the value of the medical officer and his functions, with a few notable exceptions, seem to be fully appreciated. One of the most striking exceptions is fully discussed in a recent report on the causes of the failure of the British expedition in Mesopotamia. This report, made by a board of nonmedical men, shows that lack of coordination between the chief of staff and the medical officers was an important factor in the failure of the expedition. Medical officers were not sufficiently informed of the extra demands likely to be made on their department, and when the stress came they were not equal to it.[1] The report shows that a medical officer made urgent representations in regard to the actual conditions obtaining, which in his opinion needed prompt action, and for this he was threatened with arrest and removal from his post; but when defeat came, the blame was thrown on the medical department, and the medical officers were censured and told that they should have protested more vigorously.

This is a repetition of our own experience in 1898. Our medical officers at that time were criticized because they did not distinguish between malaria and typhoid fever, and still in none of our army camps until the middle of August, 1898, were there the facilities necessary to distinguish between these diseases. They were criticized for the insanitary condition at Chickamauga and elsewhere, although they had protested against these conditions to line officers without effect. The whole story is told voluminously and in detail in the congressional report on the conduct of the War Department in the war with Spain, generally known as the Dodge report.[2]

Our medical officer is going into this war much better equipped than he was in 1898, and consequently with heavier responsibilites. But there is no increase in authority! The line officer who will receive sanitary and other professional recommendations will, it is believed, be more intelligent and more appreciative than were his predecessors in 1898. This is the most hopeful view of the situation; but is the situation fully met? Are the health of our soldiers and the care of the sick and wounded to be threatened by this sword of Damocles—suspended by so fine a thread?

Our medical officers should have higher rank and the increased authority which is secured in military life only through rank. A request to this effect has been made of the War College, with no prospect, up to the present time, of its being granted. It may be worth noting here that the Surgeon-General of the Army is not a member of the War College; neither is the Surgeon-General's office represented in that body.

In 1904 the British War Office was reorganized under Lord Esher, who was requested to provide for medical representation in this office. He replied:

> The Army Council is not and cannot be a representative body as regards the several arms and departments. The Royal Army Medical Corps exists to serve the army in a most important capacity, but the first object must be to create and maintain an army, and this is the function of the Army Council.

This was the opinion of Lord Esher in 1904. Recently[3] the same man writes:

> How much of the suffering undergone by our soldiers since the war began has been due to the short-sightedness of my committee, and notably of myself, will never be known. Certainly the control of the Adjutant-General's branch over the Royal Army Medical Corps was and is responsible not only for the early failure to grip the medical factors of the war, but they hampered conditions under which the Surgeon-General has worked. His triumphs and those of the Royal Army Medical Corps have been achieved in spite of obstacles that the subordination of science to ignorance and of elasticity to military discipline explains but cannot justify.

Having failed to secure elsewhere authority adequate to give force to the recommendations of the medical officer, the profession has appealed to the court of last resort, the Congress of the United States. The medical profession believes not only that it has the right to make this appeal, but that this is its duty. The appeal has taken the form of an amendment which is quoted on page 292. The passage of this amendment would give to the medical officers in the Army the same rank that is already bestowed on their fellows in the Medical Corps of the Navy. In the British Army Medical Corps there are three officers with the rank of Lieutenant-General, and twenty-five with the rank of Major-General. This does not include the Indian Medical Service. In the French Army the proportion of general officers in the Medical Corps is quite as high. At present there is only one officer in our entire Medical Corps with the rank of General: Surgeon-General Gorgas. The rank that goes ordinarily with the post of the Surgeon-General of our Army is that of Brigadier-General; Surgeon-

1. Lessons of the Mesopotamia Tragedy, editorial, this issue, p. 287.
2. See Medical Mobilization and the War, this issue, p. 292.
3. London Times, Feb. 3, 1917.

General Gorgas has the rank of Major-General, specially granted in recognition of his distinguished service in the Canal Zone.

The Medical Corps of our Regular Army has rendered the nation service of which we have a right to be proud. It has freed Cuba and other lands of yellow fever, has made the building of the Panama Canal an accomplished fact, and has opened up the tropics as fit habitations for the white man and his civilization.

It must be evident that the relatively low rank under which medical officers serve handicaps their work both individually and collectively. It would appear to indicate that the nation places a low estimate on its Army Medical Service—which we are sure is not intended. In his civilian work, the advice of the medical man is measured by his personal and professional reputation. When he becomes an Army officer and puts on his uniform, the worth of his opinion is measured by his rank, the insignia of which he wears; and his opinion is of no more value than the appraisal set on him by his government. When he makes a sanitary or other professional recommendation to a superior line officer, the superior grants to the expressed opinion attention corresponding to the rank of the petitioner. Higher rank should be awarded to the medical officer, not primarily to increase his pay, stimulate his patriotism or satisfy his pride, but that he may not be handicapped in rendering his best service. Let him be in a position to demand, not request, what he knows to be for the good of the Army and of the Nation.

THE SPREAD OF INFECTION AS A WAR MEASURE

We have no means of knowing to what extent the reports of the use of bacterial cultures among civilian populations as a war measure are founded on fact. Some of the alleged activities of this sort, such as the supposed application of tetanus spores to court plaster, are not likely even if true to be anything more than the vagaries of irresponsible individuals, and can hardly be believed by any one to have official sanction, much less instigation. On the other hand, definite charges have been made from authoritative sources that, contrary to the terms of the Fourth Hague Convention, pathogenic bacteria have been employed by official agencies to spread disease among men and animals. In the note from the Roumanian Ministry of Foreign Affairs to the governments of neutral states, such specific charges are made in detail and are supported by documentary evidence.

Whatever credence one gives to statements of this character, one may question whether any degree of justification exists for such measures. It is sometimes said that war is war, that it is all wanton and cruel, and that death by infection is no worse than death by shot and shell. Why, it is asked, should any means of crippling the enemy be taboo? Are belligerents to be debarred from use of the most effective methods of warfare because weak-minded people consider such methods unnecessarily brutal? Is not war always brutal, and does not the injury produced by war always spread in widening circles?

To all this the answer is that even in conducting war a choice exists between more brutal and less brutal methods. The complete extermination of a conquered populace and its replacement by the victors is not today deliberately advocated by any one, although our savage forebears often adopted such a procedure with complacency. While, in this bitterest of wars for many generations, much suffering has been inflicted on noncombatants under the plea of military necessity, it has not occurred that the whole population of a city — Liége, for example — was put at once to the sword as punishment for the temerarious resistance of its forts. There are certain limits, albeit not too well defined, to present day ruthlessness. Some degree of humanity and forbearance is possible even in war.

One of the heaviest blows at civilization in the present contest has been the willingness of some of the combatants to disregard all the restrictions agreed on during the last few centuries for diminishing the brutality of war. Military necessity or military advantage has been held to excuse practically every form of violence. In calmer times, however, almost all men belonging to the civilized and semicivilized nations have been willing to admit that there are some forms of destruction of life and property that are not justified even under the stress of armed conflict. In this class we must certainly place the utilization of pathogenic microbes for spreading infection. It does not need much imagination or even knowledge of what such practices may lead to to see in them a serious menace for the future of the world. No high explosives or artificial engine of battle can equal in catastrophic possibilities the work of the pathogenic bacteria. It is almost inconceivable that responsible men could authorize the employment of such illegitimate weapons of warfare.

One of the most tragic features of the present contest, however, is the readiness with which the world opposed to the German government accepts, as true, stories of cruel, ruthless and barbarous behavior. Whether or not bacterial cultures were used at Bucharest and other places, many people today believe that they were. The way in which the Imperial German Government has made war has caused many people all over the world to lend a ready ear to reports that would under other conditions be classed as idle rumors. Nothing is too bad or too impossible to believe. In how many strata of society will incredible stories of German warfare run from mouth to mouth for decades! This is one penalty to be paid for the acknowledged facts of German war methods, the invasion of Belgium, the sinking of the *Lusitania* and the

devastation of northern France. Military advantage is not the only thing of moment to a proud nation. It is the great misfortune of the German people that they will be charged for all time with forms of savagery which revolt most of them, and this because their rulers have authorized and carried out a plan of destructive warfare hardly paralleled in the world's history. The rest of the civilized world is now in a frame of mind about German war methods such that the attempt to spread infection by bacteria is by many persons no longer considered the incredible thing it would have appeared a short time ago. For the sake of civilization, we hope all alleged instances of this sort will be fully investigated.

THE TREATMENT OF INFECTED WAR WOUNDS

In a recent lecture,[1] Sir Almroth Wright discusses at length the development of infection in wounds with special reference to treatment, particularly of wounds received in battle. He starts on the basis that the defense against infection of the body is due in part to the bactericidal action of the liquid of the blood, in part to phagocytosis by leukocytes. The bactericidal action of the blood fluid is dependent largely on its maintaining an antitryptic condition or property — if the serum of an exudate is not antitryptic it is not bactericidal. One of the ways in which the antitryptic quality may be reduced or lost is the death or breaking up of leukocytes so that their tryptic ferments are set free and neutralize antitryptic action. Under the natural conditions in a wound, and particularly a war wound, in which case there is much injury to tissue, and infectious materials are driven deeply into the parts, situations quickly arise which are altogether unfavorable to the successful operation of the physiologic defensive mechanisms. Thus if there are dead spaces or lack of adequate drainage, there cannot be a continuous flow of fresh lymph and a steady reinforcement of leukocytes, the result being accumulation of tryptic fluid — pus — in which bacteria multiply and later pass into the surrounding tissues. Under other circumstances the wound surfaces may dry up, thereby preventing outflow of lymph as well as emigration of leukocytes and presenting what Sir Almroth Wright calls a desiccated slough-covered wound in which the infection again finds favorable conditions for rapid headway.

These unfortunate events are of course especially to be feared when the wounded lie untreated for a long time on the field or treatment cannot be applied properly because of long transport. We know that prolonged suppuration, gas gangrene, general intoxication and infection, ending in death or a more or less incomplete recovery, often only after months of suffering, have been altogether too frequent consequences of wounds received in modern warfare. The great problem is to prevent infection altogether, or if it has developed, to restrain and reduce it to such a negligible degree that prompt healing takes place nevertheless. Sir Almroth Wright emphasizes on a theoretical basis the value that hypertonic sodium chlorid solution would have under certain conditions, especially during transport when it is not possible to apply with success methods of chemical disinfection. After having removed all foreign materials in the wound and after having opened up all potential dead spaces, he would cover the wound with several layers of lint thoroughly soaked in 5 per cent. sodium chlorid solution, and on top he would place other layers of lint soaked in saturated sodium chlorid solution, the whole dressing being covered with some suitable impermeable material. By virtue of its hypertonicity, the sodium chlorid solution would induce free exudation of serum into the wound and on its surfaces, which would thus, so to speak, be cleansed and protected by the continuous action of a physiologic disinfectant. The emigration of leukocytes would be prevented, however, and under some conditions that might be an advantage, under others a disadvantage. In desiccated wounds leukocytic emigration is desirable in order to hasten the removal of sloughs; hence in this case a physiologic sodium chlorid solution would be indicated.

Sir Almroth Wright's presentation is stimulating, his experiments are ingenious although they do not reproduce the natural conditions of infected war wounds, and he undoubtedly promotes our understanding of the points to be considered in the treatment of infected wounds according to what he calls physiologic principles; but we note with some surprise that we are not informed at all as to any particular results obtained by the method he has outlined. The method consequently must be regarded at present as merely an interesting suggestion. At this moment the most successful method for the reduction of infection in wounds appears to be that of Carrel. Sir Almroth Wright himself says that he regards Carrel's method as "far the most important contribution made to surgical technic since the beginning of the war." The method is now so well known that it is not necessary to go into details. After the most painstaking cleansing of the wound and adjacent surfaces, during which every bit of bruised and otherwise injured or unhealthy tissue, all clots and foreign bodies are removed, the entire wound is subjected to a continuous flushing with neutral solution of chlorinated soda — Dakin-Carrel solution — in such a manner that no pain is caused or harm to the tissues, accompanied with frequent change of dressings. The basic principle is to reduce the infection to the point that healing proceeds without delay after approximation of the edges by suture and otherwise.

1. Wright, Sir Almroth: The Treatment of War Wounds, Lancet, London, 1917, **1**, 939; abstr., The Journal, this issue, p. 308.

Incidentally, what Sir Almroth Wright describes as the Carrel method is not, we believe, altogether correct. As we understand it, the method does not consist simply of flushing a wound with an antiseptic; it is a combination of procedures by which a chemical substance is used under specific conditions of contact, concentration and duration, and under microscopic control. It is this that sterilization would attain, making an easy closing of the wound possible.

According to reports by Carrel and others, it is possible to secure by this method complete sterilization of infected war wounds. In other words, what seems like chemical sterilization of infected wounds may be accomplished. Sir Almroth Wright seems inclined to question whether Dakin-Carrel solution is the best for this purpose; while superior fluids may be discovered, Carrel settled on the use of Dakin-Carrel solution after having tried several other disinfectants because it gave the most satisfactory results. Whether the action of this fluid is to be explained as due solely to its direct disinfecting powers or to its favoring the physiologic processes discussed by Sir Almroth Wright may be an open question which could be studied with profit; but there can be no question that Carrel's method marks a long step in advance in the practical treatment of local infections.

LESSONS OF THE MESOPOTAMIA TRAGEDY

Blunders due to incompetence and inefficiency among men of high rank seem to be unavoidable accompaniments of all wars. The interest of students of our Civil War has largely centered around such controversies. Even in the Spanish-American War, short as it was, there was abundant time for incompetence in high places and mismanagement on the part of those responsible to manifest itself. England is today in the midst of a discussion of the Mesopotamia campaign and its consequent horrors. A tendency has manifested itself in some quarters, as Sir Victor Horsley, just before he died, predicted would be the case, to make a scapegoat of the medical service. Making all allowance for difficult conditions, it must be admitted that the superior medical officers responsible for conditions in this campaign do not make out a brilliant case for themselves. While regarded as a "small sideshow" by the British War Office, the mistakes and blunders in Mesopotamia are well worth careful consideration, especially by those responsible for the administration of medical affairs in our own Army. Originally planned for the protection of the oil fields above Basrah on the Tigris River, the military expedition which reached Mesopotamia in November, 1914, was ordered by the Indian government to advance up the valley of the Euphrates toward Bagdad, the terminus of the proposed Constantinople-Bagdad Railroad. The campaign was for a time remarkably successful, and on Sept. 29, 1915, the British troops occupied Kut-el-Amara, 140 miles above Basrah. Although the medical equipment of the expedition had at no time been up to its proper strength, there was no complaint during the first part of the campaign. In November, 1915, the advance on Bagdad was begun, and at the battle of Ctesiphon a greatly superior Turkish force was encountered and 690 men were killed and 3,800 wounded out of a force of 11,000 British soldiers. The troops fell back to Kut-el-Amara, where they were besieged by the Turks until April 29, 1916, a siege of 147 days. The collapse of the campaign led to the appointment last August of a special parliamentary commission to inquire into the conduct of the campaign and especially into the provisions which were made for the care of the sick and wounded. The report of this commission to Parliament has just been made public. While obscured by a mass of official details, the main facts appear to be that medical provisions for the Mesopotamia campaign were from the beginning wholly insufficient, and that from the battle of Ctesiphon to the conclusion of the campaign, there was a complete breakdown of the medical service, with the inevitable result that the sick and wounded were deprived of proper care, lay for days on the battlefield without attention, suffered intolerably through lack of proper transportation facilities, and even when transported to the hospital ships, on account of overcrowding and lack of equipment, were left in conditions of indescribable neglect and filthiness.[1] There has been the usual effort to shift responsibility and to attribute the inadequate equipment to "the policy of limiting the general military preparations of India in the interests of retrenchment pursued for many years by the home government and the government of India." Yet in spite of all these generalizations, the parliamentary commission says that Surgeon-General Hathaway, the senior medical officer of the expedition, "did not represent with sufficient promptitude and force the needs of the service for which he was responsible and failed to urge the necessity for adequate and suitable transportation for the sick and wounded." The commission also reports that the officer directly responsible for medical shortcomings is Surg.-Gen. Sir William Babtie, Director of Medical Services of India, who "accepted obviously insufficient medical provision without protestation and without any adequate effort to improve it." General Babtie was succeeded by Surg.-Gen. J. G. MacNeece, July 8, 1915. The change did not improve conditions. Surgeon-General MacNeece, the commission says, was "an officer thoroughly desirous of fulfilling the duties assigned to him, but he was a man of advancing years and diminishing strength unequal to the position he was called upon to fill and showing no signs of the vigor and efficiency that were required." The one bright spot in the whole tragedy, according to the

1. See London Letter, this issue, p. 301.

Medical Press and Circular, is the behavior of Major, now Lieut.-Col. Robert M. Carter of the Indian Medical Service, who risked the displeasure of his superior officers by insisting on telling the facts and endeavoring to better conditions. All of his criticisms and suggestions were met with active intolerance on the part of his superior officers, and he himself was treated with great rudeness. In fact, General Cowper threatened to put him under arrest as a "meddlesome, interfering faddist." One is irresistibly reminded of our own General Brooke who, at a time when there were 10,000 cases of typhoid fever in his division at Chattanooga, was "annoyed" by the persistence of the medical officers in calling his attention to the infected water supply.

In endeavoring to sift out the essential facts from the mass of conflicting testimony and to locate the responsibility definitely, the commission finds that there was too little coordination between the medical staff and the military officers, that the director of medical services was hampered by being excluded from the staff conferences, that there was lack of coordination and cooperation between the different branches of the staff, especially between the inspector-general of communications and the medical service, that the military authorities treated the medical service without consideration, that the medical personnel and staff were deficient in numbers, and that the breakdown of the medical organization had a material effect on the morale of the troops. These specifications can all be condensed into two main criticisms, inherent in the organization of most armies, namely, the medical service has not been given the rank or authority which its importance deserves, and the work of the medical department and the views and opinions of medical officers have not been given sufficient weight by military men.

The remedy for such situations as the Mesopotamia muddle lies in giving the medical service rank and authority equal to the line officers, and making them, so far as is possible in war time, independent in all matters relating to the health of troops and especially to the care of the sick and wounded. To permit an officer with military training alone, no matter how high his rank or how brilliant his attainments as a soldier, to dictate conditions regarding the hygiene and sanitation of troops and the management of hospitals is as ridiculous as it would be to give a surgeon authority over the artillery or the aviation corps. Subject always to the necessities of warfare, the military and the medical services must be on an equality. Each line of activity requires highly specialized, technical training. To permit either one to encroach on the field of the other is not only absurd, but is often suicidal. Especially should there be the closest coordination and cooperation between the military and medical officers in order that the Medical Corps may be of the greatest assistance. This is the lesson which Japan learned in Manchuria and which the English have demonstrated on the western front.

The report of the committee on the Mesopotamia campaign should be given the widest possible publicity in this country on account of the lessons which it contains. Old, incompetent and bureaucratically trained officers were given responsibilities which they were unable to carry. Younger and more efficient men were threatened with court martial and degradation for telling the facts. Sick and wounded men were compelled to live through horrors unspeakable on account of the failure of high officials to understand the conditions under which the campaign was being carried on. Medical men were excluded from conferences and not consulted as to plans. The one man who told the truth and tried to remedy conditions was regarded as a "pest" and was threatened with court martial. Doubtless in the next year or two our country will have its own trials and perhaps scandals of mismanagement and inefficiency, but it is devoutly to be hoped that our Army officials will profit by the mistakes of our allies and that the burden of such mistakes as may be made will not fall on the helpless sick and wounded.

Current Comment

POLIOMYELITIS THIS SUMMER

Last year there were much fear and pessimistic prognosis that the summer of 1917 would witness a widespread extension of the epidemic of poliomyelitis which terrorized the country during 1916. And even this year the prognosis is being repeated. Thus, Dr. Simon Flexner in an introduction to a book on poliomyelitis by Draper, says, 'Just what the coming summer and autumn may have in store cannot be predicted, but it is altogether too much to hope that the epidemic will not prevail in some degree in this country." The reason for these prognoses is probably the history and epidemiology of the disease; it is transmitted by contact with cases and carriers, and tends to appear along the main routes of communication; one of the important epidemiologic features of poliomyelitis is its seasonal occurrence, namely, that it occurs most intensely during the months of July, August and September, although winter epidemics have occurred in Sweden, Norway and West Virginia. While this is perhaps a good basis for endeavoring by improvement in sanitation and hygiene and other methods to prevent a recurrence of the disease, it seems hardly sufficient for regarding with pessimism the outlook for the immediate future. So far there is reason to believe that the visitation of this disease during 1917 will be little more than the ordinary incidence. According to figures just made public by Health Commissioner Emerson, only seventy-seven cases have been reported to the Department of Health of New York City since Jan. 1, 1917. At the same

time last year 1,900 cases had been reported. Less than one third of the cases reported to the department of health this year as possible poliomyelitis were true cases of the disease, and the condition in New York City is much the same as that of the whole country. During the first week in July there had been four cases reported in Illinois, six cases in Massachusetts, twenty-nine cases in Montpelier, Vt., and thirteen cases in the balance of the state, four cases in Minnesota and eleven cases in Ohio, with scattering cases elsewhere.

ANOTHER WORD ABOUT MILK

The inevitable desire to help our allies by sharing our food supplies with them has led to a nation-wide speeding-up of food production in certain directions. Gardening has unquestionably receiyed a great impetus in a popular way. Certain highly valued crops, like the potato, have been planted to the utmost limit of availability of seed resources. Many of these efforts will undoubtedly bring a substantial return in the course of the coming season. The development of a productive animal, such as the dairy cow, on the other hand, is a slow, seemingly laborious and expensive procedure. Quick returns somehow find greater favor than slower results; and thus with threats of the exclusion of suitable dairy feeds from the market, with prospects of increasing costs of feedingstuffs and labor, and with a growing demand for meat, the future of the dairy cow does not always look especially secure. How can the milk supply be conserved better than by advertising its sterling worth? Milk is well nigh indispensable, not only because it furnishes an ideal and incomparable combination of food materials, some of which are scarcely obtainable from any other readily available sources, but also because it has become a necessary part of the cusine from a culinary standpoint. Cooking without milk would bring about a little anticipated rebellion both in the kitchen and at the meal service. If the physician is willing, as he surely must be, to endorse the slogan, "A quart of milk a day for every child," he should be equally prepared to render advice in respect to some of the pending questions regarding milk products. We recommend a few passages from a timely paper on milk in its relation to public health by the bacteriologist Rettger[1] of Yale University. The sour milk therapy is thus conceived:

> Sour milk is not beneficial on account of the acid or acid-producing bacteria which it contains, but, like sweet milk, tends to encourage the development of an intestinal flora from which the putrefying bacteria are greatly reduced or absent. This property milk seems to owe to the sugar which it contains. Skim milk exerts the same influence.

We have already paid our tribute[2] to the advantage that is certain to accrue from repeal of ordinances like those that have until recently been enforced in New York State which have prevented the use of this valuable food for human consumption. What skimmed milk means in actual nutrients is best understood from the report that the annual output of this inexpensive wholesome food which has hitherto been banished both by law and misguided public opinion amounts in this country to 30,000,000,000 pounds.[3] If any opponents to the pasteurization of milk still remain, they will find little consolation in Rettger's conclusions:

> Pasteurizing or boiling for a short period does not destroy the nutritional value, as numerous experiments have without doubt demonstrated, although physicians have from time to time claimed that heated milk as a diet for small children is conducive to scurvy. Where any doubt concerning this point has existed the feeding of small amounts of orange juice has been sufficient to allay fear.

So long as raw milk from tuberculous cows still continues to be used by thousands of consumers daily, this statement cannot be reiterated too often.

PHYSICIANS WHO ARE CONSCRIPTED

Some weeks ago we estimated that approximately 20,000 physicians would be subject to conscription.[4] A large number at this time find themselves subject to the first call.[5] Evidently there is considerable anxiety on the part of many of these physicians as to what disposition will be made of them. Judging from the letters we receive, some think they will be put into the "line." Just what position they will occupy in the Medical Corps we have not been informed, but they certainly will not be put into the "line." Presumably they will be detailed to the Medical Departmnet of the Army. In fact, it is generally understood that physicians who are accepted by the Exemption Board on the call will be placed at the disposal of the Surgeon-General's Office. It has been suggested by those in authority that physicians who are called, or who are subject to call, should make application for membership in the Reserve Corps.[5] It will be merely repetition if we again urge that all who are of conscription age, unless they are subject to exemption under the law, should offer themselves as members of the Medical Reserve Corps. In this group of men — we may again repeat — come those who are eligible for membership in the Medical Corps which still needs some seven or eight hundred officers.[6]

ACCEPTING COMMISSION IN THE MEDICAL RESERVE CORPS

A large number of physicians who have received their commissions as officers of the Medical Reserve Corps have not returned their acceptance papers. The War Department is now requesting, in some instances by telegram, that these papers be returned. Those receiving such a telegram must not construe it to mean that they will be ordered into active service at once; rather, it means that the Government wants to know—must know—the available numerical strength of the

1. Rettger, L. F.: Some of the Newer Conceptions of Milk in Its Relation to Health, Scient. Month., 1917, 5, 64.
2. The Effect of War on Dietary Prejudices, editorial, THE JOURNAL A. M. A., June 23, 1917, p. 1912.
3. Street, J. P.: Skim Milk—A Valuable and Unappreciated Foodstuff, the Forecast, February, 1917, p. 127.
4. Editorial, THE JOURNAL, July 14, 1917, p. 125.
5. Physicians called now probably will not have to report until between the first and the fifteenth of September, giving ample time to make an honest effort to enter the Reserve Corps voluntarily.
6. It has been announced that no one can volunteer as a soldier after passing the exemption board, but we doubt if this applies to physicians. In any event, no harm will be done by taking the suggested action.

Medical Reserve Corps. Until a physician has returned his acceptance papers with his oath of allegiance, he cannot be counted. To refuse to carry out an implied agreement is not altogether an honorable action. When a physician makes application for commission in the Medical Reserve Corps, signs and acknowledges under oath this act and then presents himself for and passes the required examination, by each of these actions he agrees to undertake service. He brings disgrace not only on himself, but also on his profession when he neglects or refuses to carry out his contract. In past crises the good name of the medical profession has always been maintained by its members. They have ever been ready to sacrifice themselves for their country. Loyalty to one's calling and love for one's country demand the prompt acceptance of a commission when it is received. Few physicians, when they appreciate their responsibility, will refuse to accept the trust which a commission imposes.

CONSCRIPTED MEDICAL STUDENTS

We regret to say that up to this time no definite arrangement has been made regarding the disposal of medical students who may be drafted and ordered into active service. There is no doubt, however, that a ruling will be made whereby they will be enabled to complete their medical education. It is important, in presenting the matter to the government for action, that definite information shall be at hand as to the actual number of medical students who are included in the first call, as well as the total number of medical students registered under the selective conscription act. It is requested, therefore, that every undergraduate medical student who is subject to conscription, now or in the future, send in his name, the name of the medical college he attended during 1916-1917, the class in which he was enrolled, his age, etc., including his serial and the numerical order of his draft. This information should be sent to the Council on Medical Education of the American Medical Association, 535 North Dearborn Street, Chicago, *at once*. A direct appeal by mail is being made to each student, in the hope that a complete list may be obtained promptly, and be available for use when the time comes. As this paragraph will not come to the attention of all medical students, physicians are asked to cooperate by bringing the matter to the attention of medical students with whom they may be in contact. IMMEDIATE ACTION IS IMPERATIVE.

Kidney Lesions from Lead Poisoning.—The transient appearance in the urine of albumin, tube casts and sometimes of kidney cells may be the first sign to call attention to the lead poisoning, or it may accompany lead colic although not directly connected with the latter. When these kidney symptoms become more persistent and tend to chronicity, a change of occupation must be insisted on as otherwise the patient is on the road to serious kidney lesions. They are not altogether the consequence of sclerosis of the vessels; the lead has a direct toxic action on the parenchyma, even before it injures the vessels permanently. The above are the conclusions drawn by Gigliolo from study of 274 cases of lead poisoning. All but ninety-six presented pronounced symptoms of kidney disturbance.—*Ramazzini*, 1915, **9**, 201.

Medical Mobilization and the War

SPECIAL ARTICLES

WAR WASTAGE: A NOTE OF WARNING TO EXAMINERS OF RECRUITS*

SIR WILLIAM OSLER, BART.
OXFORD, ENGLAND

In the grim game of war bullets and bacilli put men out of action, and the best general is the one who has the lowest percentage of wastage by the former with as little as possible from the latter. An outstanding feature of the present war has been a reversal of the usual proportion of killed and wounded to those who have died from disease. But there is another group, the unfit, who should be checked at the recruiting office, as they furnish a large contingent in our hospitals and add a needless burden of transport, care and pension.

What I desire to urge in a few words is the necessity of stopping at its source, this group. It is impossible to deal with all types of unfit men, but let me briefly indicate those who should be kept at home.

First, the Mouth Breather. "Shut your mouth and save your life" is the title of Kit Catlin's famous pamphlet, which should be reprinted every few years for distribution. The original title of the pamphlet just referred to was "The Breath of Life" and Nature meant this to pass through the nose, an organ which medically speaking reaches to the diaphram. Blocked nostrils mean: (1) weakened tonsils and pharyngeal resistance; (2) enormously increased liability to bronchitis and catarrhal troubles of all sorts, and (3) lowered defense against the pneumococcus group. The hospitals have had to bear the strain of caring for hundreds of these men who should never have passed the examining board. No matter how good his chest, or how keen he is to go, or how good his muscles, be merciful to the Army and keep the mouth breather at home. Campaigning is not for him.

Second, the Neurasthenic, who is not so easy to catch, as the signs are deceptive, and he may come up in good form. Moreover, he is keen and alert and usually anxious to go. The history is all important. Has he had a break down? There are many groups, the worst coming from men of sedentary occupations. A great many get into the army, a few pull through all right; but what I would urge is, try out the doubtful cases in the home camps. The trenches is no place for a man with unstable vasomotors. In the strain of war they break like dry twigs and become a heavy burden in the hospitals and convalescent homes. In any case when in doubt give the country the benefit.

Third, the Hippocratic Chest, as it may be called, long, narrow, thin and with, as so often happens, the vertically placed low heart. Cut out unsparingly the owners of these. If lungs and heart are not in a good "case" the head is of no use in war.

It may seem very saucy for a man who has never been trained to examine recruits to venture to give advice to his superiors, but this brief note of warning is sent to my colleagues in the United States in the hope that they may profit by the experience of one whose work has been largely with the wastage of the recruiting office.

* With this communication Sir William Osler sends a personal note which is here passed on to "all old friends":

> Congratulations on THE JOURNAL, which keeps up splendidly and is more and more read over here. We have been thrilled by the arrival of the American Hospital units, and still more by the safe arrival of the troops. I wish you could realize how much it is felt by all classes here. There is extraordinary enthusiasm and it was a great sight yesterday to see the Stars and Stripes floating over the Houses of Parliament. The American Orthopedic draft of 20, brought over by Goldthwaite, has been distributed in various hospitals and is doing splendid work.
>
> Greetings to all old friends.
>
> Sincerely yours,
>
> WILLIAM OSLER.
>
> The Athenaeum, London.

STANDARDIZATION OF THE PRACTICE OF MILITARY SURGERY—THE CLINICAL SURGEON IN MILITARY SERVICE*

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A study of the actual working of the French and British systems of military surgery reveals one important defect—a defect recognized by the French and British military surgeons themselves: There is a lack of continuity in the surgical treatment as the patient is passed from one hospital to another from the front. For instance, a patient at the regimental station may get a Wright salt pack; at the field hospital, eusol;[1] at the evacuation hospital, a bismuth-iodoform-paraffin dressing; at the base hospital, neutral solution of chlorinated soda, Carrel-Dakin. As to appliances, he may start with a Thomas splint; get plaster at the next station; Blake's splint at the third, and at the last, go back to a Thomas. The British surgeons are splendid; the British consultants are distinguished; but the system is illogical in this respect: One consultant correlates the work at the casualty clearing station for a given zone (U. S. evacuation hospital) and has no supervision over the work either in advance of this zone or behind it; another consultant correlates the surgery of a group of base hospitals, but has no supervision over the work either in advance of this zone or behind it; that is to say, as far as continuity of treatment is concerned, the line of transportation is broken transversely, correlation, if it exists at all, being accidental, not planned.

ORGANIZATION OF AN ARMY CORPS

It is obvious that a common training, a common experience, alone will give a necessary military and professional cohesion which will lead to the achievement of standardization. To this end, the organization of an army corps should include:

(*a*) A professional and nursing staff, the majority consisting of medical officers and nurses who have had similar training, that is, members and graduates of the same medical school, teaching hospital and nursing training school. The clinical director of the surgical service of an army corps should be the surgical chief of the hospital and the head of the surgical division of the medical school.

(*b*) The establishment for each army corps of a temporary field training school for surgeons, nurses and orderlies at a large base hospital in active operation from the personnel of the following teaching organizations.

(*c*) The training of surgeons, nurses and orderlies in the wards of the teaching hospital before assignment to duty.

INSTRUCTION IN MILITARY MEDICINE

During time of peace, the students in the medical school would receive a certain amount of instruction in military surgery. The house staff of the hospital would receive special military instruction. With perhaps only minor changes, the hospital would use the same methods and appliances in time of peace as would be employed in time of war. For example, I am using in my work abroad the same methods, appliances, and anesthetics and the same organization I use in Lakeside Hospital.

In this way, the leading medical schools and the teaching hospitals could in time of peace cooperate under the direction of the surgeon-general in a permanent preparedness, the same organization in time of war establishing field training schools for surgeons, nurses, orderlies, and others.

A field base hospital would be the proper place in which to establish a field training school. Since the most important surgical work is at the casualty clearing or evacuation hospitals, the staffs of the evacuation and of the field hospitals should be drawn from the best surgeons and nurses who have been trained in the base hospital. If possible, a civilian surgeon should be given no post until he has received some practical experience and training in the base hospital. The regimental medical officers also should have seen duty in the base hospital. By such an arrangement there would be approximated a continuity of treatment.

The base hospital would act not only as a training school and clearing house for the professional staff, but also as a center for the prosecution of research and a testing station and clearing house for methods of treatment, instruments and appliances.

The directors would constitute a clinical medical board, whose duty it would be to coordinate the clinical and scientific experience of the whole service. An army medical corps thus prepared would be completely standardized as to methods, surgical conceptions, instruments and appliances, and continuity of treatment from the time of injury to discharge would be established.

THE CIVILIAN PHYSICIAN IN THE ARMY

This war has shown (*a*) that rarely do surgeons—especially surgeons distinguished as practitioners, as teachers, or in research—become good executives or administrators, and (*b*) that equally rarely do good executives or administrators become clinicians.

In the organization of the Field Service of the American Army, therefore, the clinical and executive functions should be clearly differentiated, as follows:

1. The regimental surgeon must combine maximum clinical with minimum administrative function.

(*a*) For the paper work, transport, etc., the clinician should be guided and relieved by the administrative and executive organization; and

(*b*) For the treatment of wounds, he should be responsible to the clinicians at the Casualty Clearing Station and Base Hospital.

2. At the Field Dressings Station, also, the surgeon should combine maximum clinical with minimum administrative function.

3. At the Casualty Clearing Stations (U. S. evacuation hospitals) and the base hospitals, the clinical and the administrative organizations should be clearly differentiated but obviously they should work in complete harmony.

Here the commanding officers as a rule are members of the regular army. Clinicians are usually drawn from civil practice. By the separation but correlation of their functions each group is occupied along natural lines, and the best results are achieved for the service and for the greatest development of the individual.

ORGANIZATION OF ADMINISTRATIVE WORK

The work and the organization of the administrative side is obvious—not so obvious is the work and the organization of the clinical side, for certain important changes have been brought about by the experience of this war. Of first importance among these changes is the fact that, while we have organized most highly for surgery at the base hospital—and at the beginning of the war the base hospital was the place where the most important surgical work was done—*now* the most important work is done at the casualty clearing stations (U. S. evacuation hospitals). Our best operating teams, therefore, should not be held at the base hospital, but the ablest and freshest should be assigned to the advanced posts.

Colonel Kean's base hospital organization is excellent, but his organization should include the casualty clearing station (evacuation hospital) and beyond that the field and regimental stations—a complete sector. From the base hospital teams of clinicians in succession should go to the casualty station and further stations for terms of duty, and when fatigued should return to the base hospital. Base hospitals are now serving as quiescent evacuation hospitals, where cases come whose fate has been more or less established at the casualty clearing stations.

The work at the base hospital is interesting—is important; but less interesting, less important from the surgical standpoint than the work at the casualty clearing station.

If the scope of Colonel Kean's organization were to be augmented so as to include the complete group described above, and instead of organizing base hospitals alone, he

* Mailed June 6, received July 16.

1. Eusol is a nondescriptive name applied to a solution of hypochlorous acid.

were to organize clinical groups for a complete sector, to assure continuity of treatment from the field to recovery or return home, there would result more efficient treatment for the wounded, and greater interest and development for the clinician.

HOSPITAL CAPACITY IN THE FIELD OF WAR

The French and British have found by experience that the hospital capacity planned for at the beginning of the war was wholly inadequate. The following points are drawn from their experience:

1. On account of the remarkably wide and sudden fluctuations in the number of casualties, hospitals should be so constructed and their personnel so organized as to provide for a large crisis expansion.

2. The newer base hospitals here have a capacity of from 2,000 to 3,000 beds. The capacity of the Casualty Clearing Stations (U. S. Evacuation Hospitals) varies from 500 to 1,000 beds. The larger size has the following advantages: (*a*) economy in operation; (*b*) development of a strong professional staff; (*c*) large convoys can be cared for—the sick and wounded must be considered on a wholesale and not a retail basis.

3. The hospital grounds should be in excess of present needs to allow for rapid expansion for crisis needs.

4. The hospitals should be so planned that patients may be conveyed to all parts on wheels. If patients must be carried, there is always the chance, in the strain of a crisis, that the bearers may become exhausted and the whole system break down. It is very difficult to plan for receiving and caring for say 800 patients in a day, yet there have been times in the experience of every active hospital when more than half of its entire capacity was thrown upon it in a day. There is feast or famine. Nothing could be more regrettable than to fail to provide sufficient capacity for emergencies.

5. *Crisis Expansion* is splendidly provided for in British hospitals by tents containing closely placed rows of board cots. These are not used during quiescent periods but are filled in crises. Emergencies are further planned for in advance by the continual evacuation of patients to the home stationary hospitals.

6. The receiving organizations also must provide for crisis expansion: (*a*) It should be so arranged that the entire hospital can be filled within twenty-four hours. (*b*) To avoid blockade, the point of exit for the ambulances should be opposite the point of entrance. (*c*) The space should be so arranged and the reception personnel—stretcher-bearers, etc.—so organized that a number of ambulances can unload simultaneously, and the patients be distributed to their cots with no confusion and with minimum delay.

7. The casualty clearing hospital is the bag for the field hospitals; the base hospital for the casualty clearing hospitals. Crises must be planned for in advance by constant evacuation all along the line.

GIVING THE MEDICAL OFFICER THE RANK TO WHICH HE IS ENTITLED

On July 20, Senator Owen introduced an amendment to Senate Bill 1786, which is of considerable importance at the present time. It is as follows:

"On page 7, line 20, insert the following at the end of section 10:

"Provided, That hereafter the commissioned officers of the Medical Corps of the Regular Army shall be distributed in the several grades as follows:

		Per Cent.
Major generals	....	.25
Brigadier generals	....	.25
Colonels	....	4.00
Lieutenant colonels	....	8.00
Majors	23.5	.....
Captains	32.0	.....
Lieutenants	32.0	87.5
		100.00

"Provided, That when called into service the numbers of the officers of the Medical Reserve Corps shall be seven to the thousand of men in the National Guard and National Army and the relative grades of the officers of the Medical Reserve Corps shall be the same as the grades of the Regular Army.

"The President shall have authority to appoint officers of either corps as 'consultants,' with the duty of acting in an advisory capacity, making inspections and reports on medical, surgical, or sanitary questions, and such other duties as may be required by the chief of the Medical Department."

In introducing the above amendment Senator Owen submitted arguments in the form of a memorandum furnished by Dr. Victor C. Vaughan, a part of which memorandum we reproduce:

ARE WE TO FORGET THE LESSONS OF 1898?

This is a question now being asked by medical men all over this country. We have no desire to recall the sad story of typhoid fever epidemic among our soldiers in 1898 unless we may profit by doing so. It may be well for us to remember that out of a total of 200,000 enlisted men in that war, more than 20,000 developed this disease. But, says one, vaccination now prevents altogether or greatly lessens the chances of developing typhoid fever, and such an epidemic can never again occur. This may be true, and is undoubtly partly true, at least of typhoid fever; but there are other diseases for which, unfortunately, we have no protective vaccination. Some of these diseases are diarrhea, dysentery—both bacillary and amebic—scarlet fever, measles, various forms of meningitis, poliomyelitis, pneumonia, tuberculosis, etc. All infections have not yet been conquered. Among the causes of the fearful diseases of 1898—and the causes were many—was the lack of authority on the part of the medical officer. There is abundant evidence of this in various government documents. In the "Report on typhoid fever in United States military camps in 1898" the evidence that the superior authority of the line officer was responsible in many instances for the insanitary condition of the camps is abundant. This report tells us that many commands were unwisely located, and often this was done in the face of remonstrances on the part of the medical officer. Medical officers of the Seventh Army Corps generally condemned the location at Miami, and yet regiments were kept on this site until they were much reduced by illness, and at Chickamauga some regiments were placed on ground so rocky that the construction of latrines of proper depth and width was impossible. Other camp sites received the surface washings from adjacent commands. Some were contracted into half the regulation space. Many regiments were compelled to remain on the same site until the soil became bady polluted, notwithstanding the fact that there were many broad acres around about, and no hostile army was nearer than Habana. From this report we make the following quotation: "There were regiments at Chickamauga that did not move a tenth of an inch from the time of arrival in May to that of departure late in August. Requests for change in location made by medical officers were not always granted. As an illustration under this head, we may call attention to the official records of the Fifth Pennsylvania. This command reached Chickamauga Park, May 20, and was, unfortunately, located on low ground. Requests for a change in location were repeatedly sent in during June and July. The soil became muddy, the camp received the washings from camps above, the sinks rapidly filled with water and overflowed, and still requests for change in location were not heeded until August 12. As we have seen, some of the regiments were improperly located from a sanitary standpoint. This was done by superior line officers, and sometimes in the face of protests from the medical officers."

This report advised that greater authority be given medical officers in all questions relating to the hygiene and sanitation of camps, and now, as we are going into another war, the line has one general officer for every 167 commissioned officers, while the Medical Corps has but one, whatever the number of commissioned officers may be, and in an army of 1,000,000, the number of commissioned medical officers will be not less than 7,000.

The medical profession requests that one-half of 1 per cent. of commissioned officers in its corps have the rank of general officers. This seems a modest request and is allowed in the Navy; but, for some unknown reason, has so far been denied the Army. One who has served in the Medical Corps can understand and thoroughly appreciate the hesitancy with which a lieutenant in that corps may recommend to a colonel of the line that a camp site be changed or that some other sanitary improvement is desirable; and one who served in the Medical Corps in 1898 knows full well the reception such a recommendation frequently met at that time, and he can guess at the reception it is likely to receive in the future under similar conditions. If any one has doubt concerning

the attitude of many line officers of high rank in 1898 toward the recommendations of medical officers, he should read the testimony of Major-Gen. Brooke and other officers in command in the camps in 1898. This testimony may be found in the volumes of the congressional inquiry into the "Conduct of the War Department in the War with Spain," generally known as the Dodge report.

The commanding line officer at Chickamauga took no pains in his testimony to show his contempt for the advice of his own medical officers, and this contempt and disregard constituted large factors in filling the hospitals and graves with typhoid cases. We have not place here to quote largely from his testimony, but a few sentences of the testimony of General Brooke may be given:

"Q. Had any of the wells, General, been condemned by the Medical Department prior to your leaving [Chickamauga]? —A. By alleged Medical Departments. Two of them were erroneous, I believe, after investigation made by myself. The one in front of a South Carolina regiment, which, I believe, really to have been perfectly pure water. There was afterwards discovered a surface well which had been walled up and water slipped in from which this regiment—this was reported to me—used the water. That well was not far from a large sink, and possibly on lower ground. I never could understand from my knowledge of rocky strata how that well could have been contaminated. Another well lying on the road between Alexander House and Jay's mill was also condemned. I drank of that well water every time I passed it until somebody broke the pump to pieces. I suppose it was some of our energetic medical fraternity who had spent their time in finding that there was a suspicion of these two wells, and then I did not bother further about it." (Conduct of War Department in War with Spain, vi, 3080.)

In this camp there were about 10,000 of General Brooke's troops affected with typhoid fever, about 700 of whom died. This was 25 per cent. of his command.

It probably took a large part of the remaining troops to take care of those who were sick. This excellent general of the line could not understand the folly of medical officers who pointed out that the water was infected and himself drank from infected water, and notwithstanding this, by the providence of God he escaped, because he had had a previous attack of typhoid fever and was himself immune. God bless the line officer and God save the soldiers of the United States from his ignorance of sanitary law.

On the following page there is a statement of the insanitary condition of Camp Thomas made by the medical officer of the Twelfth New York Infantry. The commanding line officer was so incensed at this report that he said: "If you will give me a copy of that report, I will see that that young man goes before a court-martial for the sort of statement he has made there, if he is not protected by this commission."

This reminds me of the case of Lieutenant Edger, in the Philippines, who stamped out an attack of cholera in an adjacent village near Santa Cruz, where eighty cases occurred the first day and where half the people in the town died in less than sixty days, approximately 1,000 in number. This young medical officer so far protected the American soldiers adjacent that not one of them was lost with cholera, but in his vigilance and strenuous effort to protect them he was court-martialed by the officer of the line in charge and punished on the ground of insubordination when he insisted on taking what he deemed necessary sanitary precaution.

This young lieutenant is now in the Medical Department, and is available as a witness if any statesman desires to summon him.

On July 17, 1898, the chief medical officer at Chickamauga addressed a letter to the Adjutant-General containing recommendations concerning the improvements of sanitary conditions. In brief, the letter contained the following recommendations:

1. That the Signal Corps, which had occupied the same site for several months and which was crowded, should be moved.
2. That selected places should be designated as dumping grounds and all the waste should be collected and deposited on these places instead of being scattered through the camp.
3. That so far as possible all camp sites should be changed.
4. That the hospital of the first division of the corps be moved from the unsanitary position they occupied to a more healthful location.
5. That the village of Lytle, which was a sanitary menace to the troops, should be cleansed.
6. That all condemned sources of water supply should be effectually closed.
7. That only filtered or boiled water should be used by the soldiers.
8. That all hucksters selling doubtful food or drink should be expelled from the camp.
9. That there should be careful supervision of all food and drink sold in the canteens.

These recommendations made in July were unheeded at the time.

In his testimony, General Brooke spoke of the letter containing the above recommendations as follows: "I did not regard his letter in a very serious sense. I do not know how he came to write it. There was much complaint in that camp from men of his own profession as to his action. He caused me more trouble and annoyance than any one ever did."

Had the recommendations contained in this letter which annoyed the senior line officer been taken seriously in July the fearful harvest of sickness and death in August might have been averted.

Ninteen years have passed since our little war with Spain, and we have crossed the threshold of a great war with Germany, Austria, Bulgaria and Turkey. This war begins with the medical officer possessed of no more authority than he had in 1898. Will his recommendations be as futile as they were then? The medical profession has always been responsive to its country's demands, whether in war, in pestilence, in flood, or in famine. Conscription has never been necessary to fill its quota. Medical officers will do their best and will present their recommendations to superior line officers, but they realize that these recommendations are likely to receive scant attention, and that the medical officer will be compelled to work under a heavy handicap. The government stamp placed on the medical officer indicates the opinion that the government has of the value of his services, and that his recommendations will receive from line officers any different consideration from that accorded them in 1898 is not probable. At present the Army Medical Corps has no representation on the general staff or in the war college.

Will it be possible that camp sites, both small and great, will be selected as they were in 1898, without consultation with the Medical Corps? And are we justified in feeling that we may have some reminders of the experiences of 1898? According to the testimony of the Surgeon-General recently, given before a medical committee, the relative number of trained medical officers is not as great now as it was at the beginning of the Spanish War. We had then seven per thousand. We have now about five per thousand.

THE ENGLISH RECOGNIZE THE IMPORTANCE OF GIVING AUTHORITY TO MEDICAL OFFICIERS

In 1904 the English war office was reorganized by a committee, the chairman of which was Lord Esher. In this reorganization no provision was made for a representative of the medical army corps on the general staff, or what corresponds to our war college. At the time the surgeon-general complained of this action. In reply to this complaint Lord Esher's committee stated that while too much importance could not be attached to the sanitary service of the army in peace or in war, the committee could not accept the views of the surgeon-general. Lord Esher's committee continued: "The army council is not and cannot be a representative body as regards the several arms and departments. The Royal Army Medical Corps exists to serve the army in a most important capacity, but the first object must be to create and maintain an army, and this is the function of the army council. To admit the principle of representation would destroy the character of the council."

This was the opinion of Lord Esher in 1904. Recently (London *Times*, Feb. 3, 1917) Lord Esher writes as follows: "How much of the suffering undergone by our soldiers since the war began has been due to the shortsightedness of my committee, and notably of myself, will never be known. Certainly the control of the adjutant-general's branch over the Royal Army Medical Corps was and is responsible not only for the early failure to grip the medical factors of the war, but they hampered conditions under which the surgeon-general has worked. His triumphs and those of the Royal Army Medical Corps have been achieved in spite of obstacles that the subordination of science to ignorance and of elasticity to military discipline explains but can not justify."

THE RANK AND AUTHORITY OF THE MEDICAL OFFICER

When Stanton was Secretary of War and Hammond Surgeon-General early in the Civil War, the latter made a request of the former for advanced rank for medical officers. The great Secretary of War replied with a question: "Will increased rank make your medical men better doctors?" The Surgeon-General replied with another question: "Does increased rank make line officers, quartermasters, and those in other corps more proficient?"

There are two important considerations in regard to the rank and authority of Army medical officers. In the first place, the higher the rank obtainable the better the class of young physicians attracted to the corps. When a young man knows that whatever he may do, however skilful and energetic he may be, whatever discoveries he may make, whatever sacrifies he may undergo, the rank of colonel, with a pay of about $5,000, is the best that he can possibly look forward to in his old age, it must be acknowledged that the temptation to enter the Army medical service is not great.

In the second place, and this is of more importance, rank in the Army necessarily means much. A request or a recommendation from a colonel or a general will receive more consideration than when it comes from a lieutenant. Much of the disgrace of 1898 and the disregard shown their recommendations by superior line officers was due to the lack of rank and authority among medical men.

Specialists Wanted for Medical Service in Cantonments

The Surgeon-General of the Army wishes the names of men who are willing to accept active service and who have had training in bacteriology, serology, pathology, dermatology and venereal disease. Such men are asked to send their names at once to the Surgeon-General. The service immediately contemplated is in the cantonments where troops will soon be mobilized.

As we understand it, the men asked for by the Surgeon-General in this notice are those who have had special training and experience in the fields mentioned. Men are wanted, (1) who are competent to take charge of hospital services in these specialties, and (2) younger men who have had special laboratory or clinical training, and who can carry out scientific methods of diagnosis and treatment. These men will be needed for immediate service. In making application a statement should be given of experience and training. These positions will offer unusual opportunities for usefulness.

Red Cross Sends Commission to Roumania for Relief Work

As a further step in its program for basing American relief work abroad on accurate surveys of conditions, the Red Cross war council announces the dispatch of a Red Cross commission to Roumania. The commission is headed by Henry Watkins Anderson, a lawyer of Richmond, Va. It will undertake at once, in addition to its investigation of sanitary and health conditions, actual relief work among the Roumanian refugees. Twelve doctors and twelve nurses accompany the commission. Quantities of medical supplies, serums, vaccines and foodstuffs urgently needed in Roumania are being sent with the commission by the war council. A special emergency appropriation of $200,000 has been voted for Roumanian relief.

MEMBERS OF COMMISSION

In addition to Mr. Anderson, the chairman, the members of the commission to Roumania, as announced by Mr. Davison, are: Arthur Graham Glasgow, an engineer, Washington, D. C.; Dr. Francis W. Peabody, Boston, who represented the Rockefeller Foundation in its medical investigations in China; Bernard Flexner, Chicago, a lawyer, who has taken a prominent part in many sociological movements in the Middle West; Dr. H. Gideon Wells, Chicago, professor of pathology in the University of Chicago; Dr. Roger Griswold Perkins, Cleveland, professor of hygiene, Western Reserve University, and Dr. Robert C. Bryan, Richmond, Va. Doctors and nurses of the medical unit accompanying the commission are: Dr. W. D. Kirkpatrick, Bellingham, Wash.; Dr. Richard Penn Smith, Fort Loudon, Pa.; Dr. D. J. McCarthy, Davenport, Iowa; Dr. George Y. Massenberg, Macon, Ga.; Dr. R. H. Rulison, Syracuse, N. Y.; Dr. B. C. Hamilton, Syracuse, N. Y.; Dr. Benjamin Earl LeMaster, Macomb, Ill.; Dr. Louis H. Limauro, Lynn, Mass.; Dr. E. F. Hird, Bound Brook, N. J.; Dr. W. T. Lowe, Pine Bluff, Ark.; Dr. Joseph P. H. Grener, Chicago; Dr. Feo. Duro Guca, Chicago; Dr. William J. Kucera, New Prague, Minn.; Florence Patterson, head nurse, Washington, D. C.; Rachel C. Torrance, New York; Katherine Olmstead, Milwaukee, Wis.; Alma Forester, Chicago; Alice Gilborne, Chicago, and Anna T. Pederson, New York.

Enlargement of Training Camps for Medical Reserve Officers

Authority has been issued to increase the training camps for medical reserve officers at Fort Riley, Fort Oglethorpe and Fort Benjamin Harrison to 1,000 medical officers each. In addition to the other formations previously authorized for purposes of training and preparation, an evacuation hospital will be organized in each camp.

Training Camp for Ambulance Service at Allentown, Pa.

A training camp for special ambulance work has been organized at Allentown, Pa. At this camp the Medical Department of the Army has at present 4,700 officers and men. Major E. E. Persons is in command of the camp. About 75 per cent. of the enlisted personnel are college and university students.

Training School for Colored Medical Officers

In connection with the training camp for colored soldiers at Fort Des Moines, Iowa, there will be organized a training school for colored medical officers with ten regimental sanitary detachments.

Additions to Medical Corps

About ninety candidates qualified in the June examination for appointment to commissions in the Medical Corps of the Army.——About 235 candidates qualified in the June examination for appointment as assistant surgeons in the U. S. Navy.

Emergency Hospital Buildings

The Secretary of the Navy has submitted to Congress a supplemental estimate for the appropriation of $2,200,000, which is urgently required for the construction of emergency hospitals at New York, Annapolis, Md.; Quantico, Va.; Key West, Fla.; Great Lakes, Ill.; Mare Island, Calif., and Puget Sound, and additional buildings needed at Newport, R. I., and Norfolk, Va.

Physicians at Fort Benjamin Harrison

To the Editor:—Careful search of the list of medical officers given in special article about this camp in issue of July 21 of The Journal fails to show the names of Charles E. Cook, Jr., in the list of doctors from Maine and Charles H. Merrill of Michigan. Charles E. Cook, Jr., and Charles H. Merrill have both been in the camp continuously from the first week of the course and we see no reason why our names should be omitted.

Charles E. Cook, Jr.,
C. H. Merrill,
Fort Benj. Harrison, Ind., Co. 4, M. O. T. C.

The Salary of Medical Reserve Officers

A physician asks: 1. Do medical officers receive full salary while in training? 2. What are the necessary expenses? 3. How often is the salary paid? 4. Could a medical officer have part of his salary paid to his wife in the United States while he is in France?

1. A medical officer assigned to active duty in a training camp receives the salary of his grade while undergoing training. 2. His necessary expenses include outlay for uniform and equipment and sufficient capital to pay expenses during the first month prior to receiving his pay. These expenses include "mess" and incidentals, and will probably amount to a minimum of $35 per month. The cost of a minimum equipment averages about $65. 3. Medical officers are paid monthly. 4. Yes; by special arrangement; consult the quartermaster in charge.

Orders to Officers of the Medical Corps

Sick leave of one month to Lieut. Col. Henry D. Snyder, M. C.

Capt. George B. Foster, Jr., M. C., with his enlisted personnel and all equipment to Atlanta, Ga., for establishing a department laboratory at that place.

Capt. Edward G. Huber, M. C., to Chicago for duty.

Capt. Frederick S. Wright, M. C., to Fort Adams, R. I., and report in person to the commander of the provisional brigade, C. A., for duty.

First Lieut. Arden Freer, M. C., to Camp Wilson, Fort Sam Houston, Texas, Provisional Ambulance Co. B, for duty.

Capt. Luther R. Pouset, M. C., to Louisville, Ky., and Capt. Kerwin W. Kinard, M. C., to Chillicothe, Ohio, as camp sanitary inspectors during the period of construction of cantonments.

Capt. William K. Bartlett, M. C., to duty and station at Des Moines.

Master Hospital Sergt. Edgar T. Hitch, Med. Dept., Fort Bayard, N. M., to the Army and Navy General Hospital, Hot Springs, for duty.

Sergt. 1st Class Walter H. Bailey, Med. Dept., Fort Constitution, N. H., to Fort Andrews, Mass.

Sergt. 1st Class Oscar V. Everett, Med. Dept., to Regan Barracks, Albany, for duty.

Hospital Sergt. Francis J. Eiseman, Med. Dept., Manila, will be relieved and sent to Chicago for duty.

Sergt. 1st Class Joseph Schneider, Med. Dept., to medical supply depot, Atlanta, Ga., for duty.

Orders to Officers of Medical Reserve Corps

ALABAMA

To Army Medical School, Washington, D. C., for instruction, Lieuts. Henry Wiley Grady and Karl Frederick Kesmodel, Birmingham.

To Camp Wilson, Ft. Sam Houston, 7th Field Art., Lieut. William F. Weissinger, Uniontown.

To Ft. Benjamin Harrison for instruction, Lieut. C. R. Palmer, Tuscumbia.

ARIZONA

To Provisional Ambulance Co. B, Camp Wilson, Ft. Sam Houston, Lieut. Bascom F. Morris, Tucson.

ARKANSAS

To Army Medical School, Washington, D. C., for instruction, Lieut. Horace F. Villars, Little Rock.

CALIFORNIA

To Army Medical School, Washington, D. C., for instruction, Lieuts. Oral Bevaley Bolibaugh, Reedley; John Jay Moore, Soldiers Home, and James Archibald Orbison, Whittier.

To Ft. Benjamin Harrison for instruction, Lieut. H. M. Hawkins, San Francisco.

To San Francisco, Capt. James G. Cumming, Berkeley.

To report by telegraph to commanding general, Western Dept., for assignment to duty, Capt. Joseph G. Evans, Los Angeles.

CANAL ZONE

To Army Medical School, Washington, D. C., for instruction, Lieut. Tom Sperring Mebane, Panama City.

COLORADO

To Ft. Riley for instruction, Lieuts. G. W. Bancroft, Colorado Springs; B. C. Dorset, Denver; A. W. Rew, Ft. Collins, and E. G. Edwards, La Junta.

CONNECTICUT

To Army Medical School, Washington, D. C., for instruction, Lieuts. John Joseph Carden, Bridgeport, and Donald Gardner Russell, Wallingford.

DELAWARE

To Ft. Benjamin Harrison for instruction, Lieut. B. A. Jenkin, Wilmington.

DISTRICT OF COLUMBIA

To Washington, D. C., to Army Medical Museum, Major F. H. Garrison, Washington. To Army Medical School, Lieuts. Burgh Smith Burnet, John Marion Stanley and Ernest Kenneth Stratton, Washington.

To Baltimore for instruction in military roentgenology, Lieut. Walter Van Sweringen, Washington.

To Camp Wilson, Fort Sam Houston, Lieut. Herbert C. Neblett, Washington.

To Fort Benjamin Harrison for instruction, Capt. J. L. Norris, Washington.

To Fort Riley for instruction, Lieut. Louis A. LaGarde, Washington.

To Walter Reed Hospital, Takoma Park, Capt. John H. Selby, Washington.

To duty with Sixth Engineers, Washington, D. C., Capt. Edward B. Jones, Washington.

FLORIDA

To Army Medical School, Washington, D. C., for instruction, Lieut. Bascom Headen Palmer, Tampa.

To Fort Benjamin Harrison, Lieut. Charles S. Cooper, St. Cloud.

To Fort Oglethorpe for instruction, Lieut. Fay A. Cameron, Tampa.

To Richmond, Va., for instruction in military roentgenology, and then to Fort Oglethorpe training camp for duty, Lieut. John P. Long, Lake City.

GEORGIA

To Ambulance Co. No. 5, Camp Funston, Leon Springs, Lieut. Edward L. Moore, Statesboro.

To Fort Oglethorpe training camp for instruction, Lieut. F. X. Mulherin, Augusta.

IDAHO

To Fort Benjamin Harrison, Lieut. Fred R. Patton, Roselake.

ILLINOIS

To Army Medical School, Washington, D. C., for instruction, Lieuts. John Edwin Robinson and Leonard Webster Weaver, Chicago.

To Champaign, Ill., as post surgeon at Ground School, Av. Sec., S. C., Lieut. James H. Finch, Champaign.

To Fort Benjamin Harrison for instruction, Lieuts. F. E. Browning, Chicago, and Tom Kirkwood, Lawrenceville.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Capts. Charles H. Parkes, Chicago; William J. Uppendahl, Peoria; Lieuts. Grover C. Otrich, Belleville; Wilbur G. Little, Irving Perrill, Frederick J. Riley, Harry Robenstein, Chicago; Hiram E. Ross, Danville; William H. Maley, Galesburg; Robert D. Luster, Granite City; Harry B. Roberts, Highland Park; Winfield G. McDeed, Monticello, and Orvel A. Suttle, Mount Vernon.

To Fort Riley for instruction, Lieuts. L. D. Applewhite and L. G. Harney, East St. Louis.

To Washington, D. C., for instruction, Lieut. Walter J. Sullivan, Chicago.

To home, Capt. J. R. Hollowbush, Rock Island.

To Army Medical School, Washington, D. C., for instruction, Lieut. Frederick Arthur Blesse, Chicago.

INDIANA

To Army Medical School, Washington, D. C., for instruction, Lieuts. Chester A. Stayton, Arlie John Ullrich, Indianapolis, and Brown Shirk McClintic, Peru.

To Fort Benjamin Harrison for instruction, Lieuts. Frank A. King, Garrett, and Ulysses G. Goodwin, Monticello.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieuts. Henry W. Gante, Anderson, C. W. Ashley, Bicknell; Charles C. Crampton, Delphi; Joseph R. Dillinger, French Lick; Daniel R. Benninghof, Edgar N. Mendenhall, Fort Wayne; Clarence C. Bassett, Goodland; Fred L. Hosman, Clifford H. Mayfield, Indianapolis; Clarence E. Barcus, Logansport; Hubert P. Butts, Pierceville; David E. Reed, Russellville; Ernest E. Leeson, Sharpsville; Arvine E. Mozingo, Tipton.

To Cornell Medical College, New York, for instruction in military roentgenolgy, Capt. James W. Squire, Fort Wayne.

IOWA

To Army Medical School, Washington, D. C., for instruction, Lieut. Ward Stanley Wells, Nashua.

To Fort Riley for instruction, Lieuts. B. L. Gilfillan, Keokuk; E. B. Fulliam, Jr., Muscatine; E. D. McClean, Oskaloosa, and J. A. Matson, Purdy.

To Fort Myer, Va., for duty, Lieut. S. A. O'Brien, Mason City.

To Rockefeller Institute, New York, for instruction in laboratory work, Lieut. Daniel J. Glomset, Des Moines.

KANSAS

To Fort Riley for instruction, Lieuts. E. H. Gist, Beattie; S. A. McCool, Neosho Falls, and W. C. Bundrant, Partridge.

To Fort Benjamin Harrison for instruction, Lieut. S. H. Martin, Cambridge.

To Fort Riley for instruction, Lieut. S. Adams, National Military Home.

KENTUCKY

To Army Medical School, Washington, D. C., for instruction, Lieut. James White Bruce, Louisville.

To Fort Riley for instruction, Lieut. C. P. Price, Harrodsburg.

LOUISIANA

To Fort Oglethorpe for instruction, Capt. Frederick T. Brown, New Orleans.

MAINE

To Fort Benjamin Harrison for instruction, Lieut. H. J. Everett, Portland.

MARYLAND

To Army Medical School, Washington, D. C., for instruction, Lieuts. Arthur Maynard Backon and Arthur Lee Hichew, Baltimore.

To Fort Benjamin Harrison, Lieuts. John F. Byrne, Baltimore, and L. G. Taylor, Perryville.

To Provisional Ambulance Co. B, Camp Wilson, Fort Sam Houston, Lieut. Herbert L. Quickel, Takoma Park.

To Fort Oglethorpe for instruction, Capt. H. C. Knapp and Lieut. E. E. Mayer, Baltimore.

MASSACHUSETTS

To Army Medical School, Washington, D. C., for instruction, Lieuts. Ross Golden, James Blaine Montgomery and Norman Scott, Boston.

To Boston for instruction in military roentgenology, Lieut. Arthur J. Horrigan, Springfield.

To Eagle Pass, Ambulance Co. No. 7, Lieut. Thomas P. Jones, Boston.

To Fort Benjamin Harrison for instruction, Capts. Frederick R. Ilsley, Medford; J. H. Wyman, Medway; E. B. Bigelow, Worcester; Lieuts. J. K. Stoddard, Boston; E. H. Hughes, Holyoke; Raoul G. Provost, New Bedford; H. A. Clark, North Andover, and W. E. Denning and M. Lincoln, Worcester.

To Motor Truck Group, Fort Sam Houston, for duty, Lieut. Abram L. Van Meter, Boston.

To report to the commanding general N. E. Department, for duty, Lieut. Frank Piper, Boston.

MEXICO

To Army Medical School, Washington, D. C., for instruction, Lieut. Otto Richard Brown, Tampico Tamps.

MICHIGAN

To Army Medical School, Washington, D. C., for instruction, Lieut. Robert Alexander Hale, Ann Arbor.

To Fort Benjamin Harrison for instruction, Lieut. Hugh W. Dicken, East Jordan.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Major David B. Downing, Detroit; Capt. Walter Rob-

ert T. Sharpe, Romeo; Lieuts. Milton A. Darling, Ann Arbor; Edward J. Agnelly, Lannes I. Condit, Philip Isard Froude, George Hoffmeister, Eugene Smith, Jr., Detroit; Edward A. Florentine, Ewen; George R. Goering, Flint; Ansel B. Smith, Grand Rapids; Albert V. Braden, Ishpeming; Burns R. Eastman, Muskegon, and Floyd W. Lockwood, South Lyon.

To Fort Riley for instruction, Lieut. James L. Walsh, Iron River.

To Mount Clemens, Mich., flying school for duty as post surgeon, Lieut. Alpheus F. Jennings, Detroit.

To Fort Benjamin Harrison for instruction, Capt. O. H. Clark, Kalamazoo, and Lieut. Harry C. Miller, Hillsdale.

MINNESOTA

To Army Medical School, Washington, D. C., for instruction, Lieuts. Edward Spender Murphy, Brainerd, and Cleon Joseph Gentzhow, Minneiska.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieut. Richard R. Cranmer, Minneapolis.

To Fort Riley for instruction, Lieuts. C. F. McCusker, Minneapolis, and F. M. Manson, Worthington.

To Fort Riley for instruction, Capt. J. Butler, Minneapolis.

MISSISSIPPI

To Army Medical School, Washington, D. C., for instruction, Lieuts. John Robin DeVelling, Laurel, and Egbert Hayes Wesson, New Albany.

To Fort Oglethorpe for instruction, Capt. B. J. Marshall, Agricultural College, and Lieut. J. L. Parkes, Carthage.

To Rockefeller Institute for Medical Research, New York, for instruction in laboratory work, Lieut. R. Richardson, Pheba.

MISSOURI

To Army Medical School, Washington, D. C., for instruction, Lieuts. Francis V. Frazier, Alta Mont; Frank LaRue, Dexter, and Noble DuBois McCormack, St. Louis.

To Fort Benjamin Harrison for instruction, Lieut. J. M. Brown, Maysville.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieuts. Curtis A. Hunsaker, Kansas City, and Franz H. Harms, St. Louis.

To Fort Riley for instruction, Capt. R. D. Alexander, St. Louis; Lieuts. C. A. Abramopoules and H. M. La Rue, Kansas City; L. E. Toney, Piedmont; Albert S. J. Smith, St. Joseph; T. R. Ayars, H. L. Bremser and S. D. Fox, St. Louis.

To report by telegraph to commanding general, S. D. Fort Sam Houston, for assignment, Capt. Harold P. Kuhn, Kansas City.

To Washington, D. C., for instruction, Lieut. Montague M. Meyers, St. Louis.

To Fort Riley for instruction, Lieut. W. H. Hill, St. Joseph.

MONTANA

To Fort Riley for instruction, Lieut. F. W. Loring, Whitehall.

NEBRASKA

To Fort Riley for instruction, Capts. H. S. Andrews, Mindon; S. C. Clements, Neligh, and Lieut. Clifford L. Hooper, Lewellen.

To Fort Riley for instruction, Lieut. C. C. Johnson, Creighton.

NEVADA

To Fort Riley for instruction, Lieut. D. A. Turner, Goldfield.

NEW HAMPSHIRE

To Fort Benjamin Harrison for instruction, Lieut. D. R. Chase, Lebanon.

To Examine National Guard and then to Fort Benjamin Harrison for instruction, Lieut. Robert O. Blood, Concord.

To Washington, D. C., for instruction, Lieut. Guy D. Tibbetts, Bennington.

NEW JERSEY

To Fort Benjamin Harrison for instruction, Capt. L. F. Donohoe, Bayonne; Lieuts. S. E. Weiner, Atlantic City; J. G. Coleman, Hamburg; L. H. Sparks, Lakewood; J. B. Winterseen, Moorestown; G. Blackburne, Newark; L. M. Suchoff, Paterson; S. B. Kaufmann and M. H. Leaver, Quakertown; F. W. Sell, Rahway; L. Ely, Somerville; C. J. Slack, Trenton, and S. Campbell, Woodbury.

To Fort Oglethorpe for instruction, Lieut. L. C. Russell, Newark.

To Fort Benjamin Harrison for instruction, Lieuts. S. Stern, Atlantic City, and H. G. Smith, Cedar Grove.

Relieved from further active duty, Capt. William J. Condon, New Brunswick.

NEW YORK

To Army Medical School, Washington, D. C., for instruction, Lieuts. Roland Albert Davison, Brooklyn; John William McKeever, Newburgh; Cornelius A. Denehy, Paul Barrus Johnson, Laurent Liscelles La Roche and Virginius Minervini, New York City.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieuts. Raymond C. Hill, Bath; William Edward Skidmore, Brooklyn; John R. Evers, Elmsford, and Henry W. Jackson, New York.

To Fort Benjamin Harrison for instruction, Major D. A. Sinclair, New York; Capts. Arthur S. Moore, Middletown; R. H. Halsey, H. M. James, C. Philips, R. M. Taylor, New York; F. A. Hunt, Pompey; J. N. Boyce, Stanfordville; D. C. Wiggin, Staten Island; Lieuts. E. D. Gordon, J. J. Hauff, E. L. Hergert, F. G. Reed, A. A. Scouler and M. I. Strahl, Brooklyn; F. M. Neuendorf, Johnstown; L. W. Blake, A. J. Ellis, W. Goldstein, G. F. Gracey, J. Grosner, M. G. Herzfeld, D. Kramer, J. Leo, A. Lustgarten, P. J. Manheims, B. F. Morowitz, L. A. Newfield, S. V. Rosenkranz, Alfred A. Schwartz, R. E. Seibels, V. C. Von Unruh, M. R. Walter and M. Warren, New York; L. M. Simonson, Pelham; T. G. Tousey, Rochester, and F. J. Herbig, Staten Island.

To Fort Myer, Va., examining men on duty for tuberculosis, Lieut. H. C. Drew.

To Fort Oglethorpe for instruction, Lieut. T. R. Barry, Ossining.

To Rockefeller Institute, New York, for instruction in laboratory work, Lieut. Russell LaF. Cecil, New York.

To Field Hospital Co. No. 7, Eagle Pass, Lieut. Emanuel Kline, New York.

To home, Lieut. Robert Malcolm, Yonkers.

To Army Medical School, Washington, D. C., for instruction, Lieut. Richard Samuel Moynan, New York.

To Fort Benjamin Harrison for instruction, Lieuts. H. Gross, C. F. Howland, H. Katz, W. G. Noe and W. H. Sanford, New York.

OHIO

To Army Medical School, Washington, D. C., for instruction, Lieuts. Stanley Gibson Odom and Raymond Albert Tomassene, Cincinnati.

To Fort Benjamin Harrison for instruction, Lieuts. I. I. Yodar, Cleveland; W. H. Henry, Hamden, and L. Shields, Xenia.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Capt. James B. Dougherty, New Berlin; Lieuts. Homer G. Scranton, Alliance; Merrick F. McCarthy and Marcellus L. Peterson, Cincinnati; Albert J. Brainard, Frederick S. Cooper, David R. Kline, William Frederick Rohland and Richard E. Stifey, Cleveland; Sampel D. Edelman and Walter H. McKay, Columbus; William H. Henry, Hamden; Robert C. Rind, Springfield; James K. Biddle, Steubenville; William A. Deerhake, St. Marys; James Alonzo Belyea, Toledo, and Delbert E. Hoover, Warren.

To Fort Benjamin Harrison, Lieut. Charles H. Bailey, East Liverpool.

OKLAHOMA

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieut. Edgar A. Johnson, Hugo.

To Fort Riley for instruction, Lieut. George Edward, Oklahoma City.

OREGON

To Fort Riley for instruction, Capt. P. Rockey, Portland; Lieuts. W. T. Gullion, Eugene, and P. J. Keizer, North Bend.

PENNSYLVANIA

To Allentown, Lieuts. T. M. Armstrong and Furman R. Suits, Philadelphia.

To Army Medical School, Washington, D. C., for instruction, Lieuts. Arhut Raymond Gaines, Altoona; Andrew Jackson Griest, Harrisburg; Jay DeRue Mingos, Laquin; Henry Cheesman Dooling, Norwood Station; Philip Jefferson Lukens, Jr., Philadelphia; Daniel Clyde Hankey, Paul Maxwell and Neuman Kyle, Pittsburgh, and Harold Dana Rogers, Westchester.

To Cornell Medical College for instruction in military roentgenology, Capt. Francis F. Borzell, Philadelphia.

To Fort Benjamin Harrison for instruction, Major J. H. Jopson, Philadelphia; Capts. H. J. Repman, Charleroi; D. J. Donnelly, Philadelphia; Lieuts. R. McK. Alexander, Bolivar; C. S. Abbott, Bristol; J. L. Junk, Connellsville; E. F. Corson, Cynwynd; F. A. Rupp, Lewistown; A. L. Hickok, Meshoppen; A. V. Carl, Numidia; S. Jaffe, Norristown; E. H. Erney, J. E. Hume, F. J. Kelly and P. A. Trau, Philadelphia.

To Fort Oglethorpe for instruction, Major William E. Ashton, Philadelphia; Capt. H. Winsor, Haverford; Lieuts. E. R. Plank, Carlisle; F. D. Thomas, Dorranceton; F. T. Romberger, Elizabethville; J. L. Lenker, Harrisburg; C. R. Snyder, Maryville; W. D. Hunter, Monessen; J. F. M. Snyder, New Kensington; W. H. McKeever, C. E. G. Shannon, H. M. Shannon, J. Speese, C. J. Stamm, F. A. Stiles and A. C. Strop, Philadelphia; D. R. Kunkelman, M. Spiro and G. W. Van Gorder, Pittsburgh; J. F. Zychowicz, Scranton, and C. K. Wagener, Swissvale.

To Washington, D. C., for instruction, Lieuts. Harvey C. Updegrove, Easton; Morris A. Slocum, Etna; Edgar T. Chatham, Pittsburgh, and William J. McGregor, Wilkinsburg.

To Fort Benjamin Harrison for instruction, Lieuts. W. E. Grove, Johnstown; H. Cooper, E. R. Sibley and Charles H. Wells, Philadelphia.

To Fort Oglethorpe for instruction, Lieuts. J. F. Wagner, Bristol, and H. Schmid, Pittsburgh.

To Fort Riley for instruction, Lieut. W. F. Howard, Pocatelle.

PORTO RICO

To report in person to commanding general, Eastern Department, for assignment, Capt. Emmett I. Vaughn, Central Aguirre.

RHODE ISLAND

To Fort Benjamin Harrison for instruction, Lieut. Peter L. Keough, Pawtucket.

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieut. Edward E. Fitzpatrick, Woonsocket.

SOUTH CAROLINA

To Allentown, Pa., Lieut. John R. Boling, Columbia.

To Army Medical School, Washington, D. C., for instruction, Lieuts. Albert Berchmans Pavy, Charleston, and Marion Rudolph Mobley, Florence.

To Fort Benjamin Harrison for instruction, Lieut. G. W. Hill, Catawba.

SOUTH DAKOTA

To Army Medical School, Washington, D. C., for instruction, Lieut. Earle Douglass Quinnell, Sisseton.

To Fort Riley for instruction, Lieut. James C. Walton, Isabel.

TENNESSEE

To Army Medical School, Washington, D. C., for instruction, Lieuts. James Walsh McClaran, Jackson; Paul Edgar McNabb and James

Monroe Trout, Knoxville; Henry Earl Fraser, Nashville; Glenn Holway Reams, Winchester, and Manton Leonard Shelby, Woodlawn.

To Fort Oglethorpe for instruction, Lieut. Edwin Dial Watkins, Memphis.

To Fort Oglethorpe, S. H. Long, Chattanooga.

TEXAS

To Army Medical School, Washington, D. C., for instruction, Lieuts. Douglas Hamilton Mebane, Edmund Dumas Mills, Robert Keith Simpson and Paul Henry Streit, Galveston; William Love Starnes, San Antonio; James Winn Sherrill, Temple, and Frank McAlphin Moose, Weatherford.

To Sparta, Wis., for temporary duty, Capt. Edward G. Huber, Fort Bliss.

VERMONT

To Fort Benjamin Harrison for instruction, Lieut. A. J. Greenwood, Springfield.

VIRGINIA

To Army Medical School, Washington, D. C., for instruction, Lieut. Percy Elisha Duggins, Norfolk.

To Fort Oglethorpe training camp, Lieut. J. A. Rollings, Roda.

To Richmond, Va., for instruction in military roentgenology, Lieut. H. S. Stern, Richmond.

To Walter Reed Hospital, Takoma Park, Lieut. Charles V. Carrington, Richmond.

WASHINGTON

To Fort Riley for instruction, Lieut. R. S. Stryker, Ridgefield.

So much of Par. 8, S. O. 155, July 6, 1917, War D., as relates to Lieut. F. L. Horsfall, Seattle, revoked.

Honorably discharged, Lieut. F. L. Horsfall, Seattle.

WEST VIRGINIA

To Fort Oglethorpe for instruction, Capt. R. H. Powell, Fairmont.

WISCONSIN

To examine National Guard and then to Fort Benjamin Harrison for instruction, Lieut. Edward W. Hanson, Three Lakes.

To Fort Riley for instruction, Capt. F. W. Vankirk, Janesville, and Lieut. F. R. Borden, Plainfield.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ILLINOIS

Personal.—Dr. Eugen Cohn, assistant superintendent of the Chicago State Hospital, has been appointed superintendent of the Kankakee State Hospital, and will take charge of the Institution, August 15.——Dr. Cyrus H. Anderson, McLeansboro, has been appointed superintendent of the Anna State Hospital, succeeding Dr. Joseph A. Campbell (resigned).——Dr. Henry B. Carriel, Jacksonville, has been appointed state superintendent of the Dixon School and Colony for epileptics.——Dr. George A. Zeller, Peoria, has been appointed superintendent of the Alton State Hospital.——Dr. S. Victor Balderston, Evanston, director of the Northwestern Ambulance Company, No. 9, has been commissioned captain, M. O. R. C., U. S. Army.

Chicago

Typhoid at State Hospital.—July 16, four cases of suspected typhoid fever were reported at the Chicago Hospital for the Insane. An investigation is under way.

Personal.—Dr. Allen B. Kanavel delivered a lecture before the City and County Medical Society, Portland, Ore., July 16, on "Infections of the Hand."——Dr. Hugh McGuigan recently lectured before the faculty and students of the Graduate Summer Quarter in Medicine of the University of Illinois on "Blood-Sugar in Relation to Diabetes."

Increase in Sanitary Troops.—Illinois Field Hospital Company No. 4, commanded by Major James J. McKinley, was mustered into the federal service, July 21, by Capt. Edward G. Huber, M. C., U. S. Army.——Illinois Field Ambulance Company No. 1 was mustered into service, July 22, by Lieut.-Col. Jacob Frank, chief surgeon, Ill. N. G. The company is under the command of Capt. George U. Lipshulch.

The Chicago Lying-In Hospital Opens New Building.—The new building of the Chicago Lying-In Hospital was opened this week. The hospital will have 120 beds and will be "open," i. e., any reputable physician may treat patients in the hospital. It has ample facilities for teaching both in the amphitheater and at the bedside. It is proposed to affiliate the institution with the Otho S. A. Sprague Memorial Institute for Medical Research so that the hospital may take an active part in the teaching of obstetrics.

INDIANA

Trachoma Quarantine Threatened.—Dr. John H. Hewitt, Terre Haute, a member of the state board of health, is reported to have asked the Vigo County Commissioners to condemn the town of Taylorville, and to order the 800 people who live there to move away, because of the prevalence of trachoma. In case the commissioners refuse to act, a permanent quarantine, it is said, will be ordered.

Personal.—Dr. C. Edward Harris, Bloomington, who was injured by the overturning of his automobile recently, is under treatment at the Methodist Hospital in Indianapolis.——Dr. Harry S. Hatch has been appointed superintendent of the Sunnyside Sanatorium, established by Marion County for the treatment of patients suffering from tuberculosis.——Dr. Donald C. McClelland, La Fayette, has been placed in command of Ambulance Company No. 3, Ind. N. G.——Dr. Edson K. Westhafer, New Castle, has been commissioned captain, M. C., Ind. N. G., and assigned to duty with the First Infantry.——Dr. Arett C. Arnatt, La Fayette, has been commissioned captain, M. C., Ind. N. G., and assigned to duty with the First Indiana Field Artillery.——Capt. Fletcher Gardner, Bloomington, has been commissioned major, M. C., Ind. N. G., succeeding Major George W. Tuomey, New Albany (resigned).

KENTUCKY

Hospital Burns.—The division hospital of the Illinois Central system, at Paducah, was burned, July 10, causing a loss of $175,000. One patient and one nurse were injured. The hospital will be rebuilt immediately.

Fayette County Against Tuberculosis.—Fayette County has initiated an energetic campaign against tuberculosis, and is working to secure $55,000 for a sanatorium. Contracts have already been awarded for the equipment of a building, which will be used pending the completion of the sanatorium.

Kentucky Valley Physicians Meet.—The annual meeting of the Kentucky Valley Medical Association was held in Jackson, July 6 and 7. The society was entertained with a luncheon at the Trachoma Hospital, Jackson, by Surg. John McMullen, U. S. P. H. S. Torrent was selected as the next place of meeting, and the following officers were elected: Dr. Thomas C. Holloway, Hazard, president; Dr. George F. Doyle, Winchester, vice president, and Dr. Luther Bach, Jackson, secretary-treasurer.

Personal.—Dr. Ralph DuCasse, city bacteriologist of Paducah, has resigned to accept an appointment as assistant on the dermatologic staff of the Cincinnati General Hospital.——Dr. Charles G. Daugherty, Paris, was severely burned by an explosion of natural gas at his house.——Dr. Robert T. Hocker, Arlington, has been made historian for life of the Southwestern Kentucky Medical Association.——Dr. Jesse M. Moore, Princeton, has been appointed district surgeon of the Illinois Central system, succeeding Dr. Joseph A. H. Miller, deceased.

Health Board Loses Suit.—The court of appeals of Kentucky, in an opinion handed down by Judge Hart, reversed the decision of the lower court in the suit of Dr. Louis Frank, Louisville, and Miss Margaret Hatfield, nurse, against the state board of health. The lower court had held that Miss Hatfield could not administer an anesthetic without having first passed the examination before the state board of health and without possessing a certificate to practice medicine. The crux of the case was whether the administration of anesthetics constitutes the practice of medicine within the meaning of the Kentucky statutes regulating the practice of medicine. The court held that "giving the medicine prescribed by the physician in charge, who diagnosed the case and directed the time and manner and character of the medicine to be administered" is not practicing medicine. The board insisted that, in administering anesthetics, the person must exercise judgment in the amount given, and must watch the condition of the patient to determine the effect of the anesthetic, and that this comes within the definition of practice of medicine. The higher court held that such a view would necessitate that every trained nurse should possess a license to practice medicine.

LOUISIANA

License Revoked.—An official communication states that, by judgment rendered by the courts of Louisiana on May 2,

the license of Dr. Eustus D. Robbins of Baton Rouge was revoked, on conviction of felony.

Personal.—Dr. Cosimo Noto, New Orleans, is at present serving with the Italian army on the Austrian frontier as a captain in a field hospital.——Dr. Thomas E. Wright, Monroe, has been appointed a member of the state board of medical examiners.

Anthrax Investigation.—The state board of health is making an investigation to determine whether a shaving brush, purchased from a New Orleans mail-order house, and supposed to be infected with anthrax bacilli, was responsible for the infection and death of a telegraph operator at Pass Christian, Miss.

Physician Wins Suit.—Dr. Clarence Pierson, Jackson, superintendent of the State Insane Hospital, who sued the New Orleans *Times-Picayune* for $100,000 damages, on account of the publication of articles describing alleged conditions at the institution, was awarded a judgment of $7,500 and court costs, July 16, by the Civil District Court, New Orleans.

MAINE

Personal.—Dr. Leverett D. Bristol has been appointed state health commissioner of Maine.——Dr. Harrison J. Hunt, Bangor, surgeon of the Crocker Land Expedition, arrived in New York, June 20.——Majors Clarence F. Kendall, Biddeford, John G. Towne, Waterville, and Capt. Delbert M. Stewart, South Paris, have been appointed a board of officers for the examination of candidates to fill five vacancies for the grade of first lieutenant in the Maine Medical Corps.

State Association Meeting.—At the annual meeting of the Maine Medical Association, held in Portland, June 13 and 15, under the presidency of Dr. Willis F. Hart, Camden, a resolution was adopted favoring national prohibition during the continuance of the war. The following officers were elected: president, Dr. James A. Spalding, Portland; vice presidents, Drs. George H. Coombs, Waldoboro, and Delbert M. Stewart, South Paris, and secretary-treasurer, Dr. John B. Thompson, Bangor (reelected).

MARYLAND

Inspection of Hospital Train.—Maryland's first hospital train was sent to Washington, July 21, to be inspected by members of the Medical Corps of the Army and of the War College. The train was completed under the direction of the Maryland Preparedness and Survey Commission, according to plans prepared by Dr. Daniel Z. Dunott, chief surgeon of the Western Maryland Railroad, and with the cooperation of the Western Maryland, Baltimore and Ohio, and Pennsylvania railroads. One car is fitted up as an operating room and the other cars as wards.

To Study Soldiers' Needs.—To prepare Baltimore to cope with social problems arising from the war and to cooperate with any federal movement of like nature, a public meeting was held, July 17, under the auspices of the Alliance of Social and Charitable Agencies. An outline of relief work in Canada was presented by George L. Jones, secretary of the Henry Watson Children's Aid Society of Baltimore. A committee of five was named to formulate plans of mobilization for Baltimore. In the absence of the president of the alliance, Dr. J. H. Mason Knox, Jr., presided.——Dr. Archibald C. Harrison, Baltimore, has been appointed director of the Maryland University Base Hospital Unit.

MINNESOTA

Poliomyelitis Clinic.—The free poliomyelitis clinic established in Minneapolis last month has cared for 112 patients. A similar clinic opened in St. Paul, July 9.

Personal.—Dr. Francis G. Blake has been appointed professor of medicine in the Minnesota Medical School of the University of Minnesota, and has begun work.

Ambulance Company Organizes.—An ambulance company has been organized in St. Paul, to complete the quota of the state troops. The officers assigned to this company are Drs. Nels G. Mortensen, Andrew Christiansen, Joseph L. Martineau and John Sibert of St. Paul, and Dr. Harold W. Stone of Wayzata.

Hospital Items.—The Sanford Drew Hospital, Farmington, was destroyed by fire, June 14. The patients were removed without casualty.——St. Anne's Home for Aged People, Duluth, has been remodeled and converted into a hospital at a cost of about $30,000. The institution will accommodate 100 patients.

Sanatorium Association Meeting.—The second semiannual meeting of the Minnesota Sanatorium Association was held in St. Paul, July 10. To meet a request from the War Department for twelve tuberculosis experts to assist the regular staff at Forts Snelling, Oglethorpe and Riley, the following committee was designated: Drs. Arthur T. Laird, Duluth; George W. Beach, State Sanatorium, and Ignatius J. Murphy, St. Paul.

Assessments for Sanatorium Maintenance.—The board of commissioners of the Southwestern Minnesota Tuberculosis Association has passed resolutions levying a total of $25,000 against the counties of the district for the maintenance of the sanatorium during 1918. The following are the assessments: Jackson County, $3,641.66; Pipestone County, $2,400.75; Rock County, $2,568.88; Nobles County, $3,833.35; Murray County, $2,954.60; Lincoln County, $2,481.40; Lyon County, $3,951.10, and Cottonwood County, $3,179.26.

Higher Degrees in Medicine.—The University of Minnesota has just granted higher degrees in clinical medicine to three physicians, as follows: Dr. Golder Louis McWhorter, doctor of philosophy (surgery); Dr. Henry William F. Woltmann, doctor of science (neurology), and Dr. Hood Taylor, doctor of science (pediatrics). Degrees of master of science in surgery were granted to Drs. Egerton Lafayette Crispin and Francis Bartholomew McMahon. Also the degree of master of science in pathology was granted to Della Gay Drips and Dorothy Foster Pettibone.

MONTANA

State Health Officers Meeting.—The annual meeting of the Montana State Health Officers Association was held in Kalispell, July 9 and 10, under the presidency of Dr. Joseph C. Denney, Clydepark. The association adopted resolutions favoring selective draft. Dr. Lawrence Stevens, Laurel, was elected president, and Dr. Patrick H. McCarthy, Butte, vice president.

State Medical Society Meeting.—The thirty-ninth annual meeting of the Montana State Medical Association was held in Kalispell, July 11 and 12, under the presidency of Dr. John A. Donovan, Butte. One of the principal topics of discussion was "What Is the State of Montana Going to Do In Supplying Doctors for the Army? Twelve members of the association answered this question by taking the examination for admission to the Medical Officers Reserve Corps of the Army. A resolution was adopted calling on Congress to pass a selective conscription law for physicians. The following officers were elected: Dr. Arthur Morrow, Kalispell, president; Harry B. Farnsworth, Missoula; Willoughby G. Dye, Great Falls, and Albert R. Varco, Miles City, vice presidents; Dr. Elmer G. Balsam, Billings, secretary-treasurer (reelected); Dr. Rudolph Horsky, Helena, delegate to American Medical Association, and Dr. George M. Crabb, Deer Lodge, alternate. Butte was selected as the next place of meeting.

NEW HAMPSHIRE

Personal.—Dr. Charles H. Dolloff, assistant surgeon of the New Hampshire State Hospital, Concord, assumed his duties as superintendent, July 1, succeeding Dr. Charles P. Bancroft, whose resignation took effect on that date.——In the case of Mrs. Margaret Winn, who sued Dr. Julia A. Chase, Portsmouth, to recover $10,000 for alleged malpractice, the jury, June 25, returned a verdict in favor of Dr. Chase.

State Society Officers.—At the one hundred and twenty-sixth annual meeting of the New Hampshire Medical Society, held in Concord under the presidency of Dr. Emdon Fritz, Manchester, the following officers were elected: Dr. Fred S. Towle, Portsmouth, president; Dr. Charles P. Bancroft, Concord, vice president; Dr. Dennis E. Sullivan, Concord, secretary; Dr. David M. Currier, Newport, treasurer, and Drs. Charles S. Walker, Keene; Emery M. Fitch, Claremont; Robert J. Graves, Concord; Frank E. Kittredge, Nashua; Abram W. Mitchell, Epping; Forest L. Keay, Rochester; Richard E. Wilder, Whitefield; Frederick E. Clow, Wolfeboro; Alpha H. Harriman, Laconia, and Frederic von Tobel, Lebanon, councilors. The society adopted resolutions on the retirement of Dr. Charles P. Bancroft from the superintendency of the New Hampshire State Hospital, after thirty-five years of service, and also favored an immediate tuberculosis survey of the state. The president appointed as a committee on the control of cancer Drs. Frederick E. Clow, Wolfeboro; Howard N. Kingsford, Hanover, and John C. O'Connor, Manchester.

NEW YORK

Personal.—Dr. Clifford R. Hervey, Oswego, of the state department of health has been appointed sanitary supervisor of the territory, including Jefferson, St. Lawrence and Franklin counties.

College of Physicians and Surgeons Remodeled.—The old building, at the northwest corner of Fourth Avenue and Twenty-Third Street, historic as the original home of the College of Physicians and Surgeons, is being remodeled into a training school to receive war cripples and to educate and develop them. The school is organized under the War Council of the American Red Cross, and is temporarily under the direction of Dr. Edward T. Devine, head of the New York School of Philanthropy. It has been endowed by a donation of $50,000 and the use of the building by Mr. Jeremiah Milbank.

New York City

Personal.—Dr. Winthrop T. Talbot, Flushing, has been appointed advisor in Alien Industrial Education to the New York State Bureau of Industries and Immigration.

Low Death Rate for City.—For the week ending July 14, the death rate for this city was the lowest yet recorded, being 10.36 per thousand of population. The death rate among babies under 1 year of age was 85 for each thousand births for the period since January 1; for last year it was 93.

Demonstration War Hospital Now Ready.—The demonstration war hospital on the grounds of the Rockefeller Institute at Sixty-Fourth Street and Avenue A is almost ready for service in instructing surgeons and nurses as to the advanced methods of surgery and caring for the wounded, in preparation for the work abroad.

"Patent Medicine" Men Win Lawsuit.—The manufacturers of "patent medicines" have won an important decision over the department of health before the Appellate Division of the Supreme Court, which declares invalid the ordinance requiring the manufacturers of all "patent medicines" to register all the ingredients of such remedies with the department of health. The court considered the ordinance unreasonable, since it had not been ratified by the state legislature.

Pier for Red Cross.—The dock commissioner has turned over to the American Red Cross the pier at Fifty-Seventh Street and North River for the exclusive use of the organization in the handling of supplies for the Army. Two large buildings will be erected at the pier for the use of the society. Supplies will be received and distributed through this station.

Bellevue Hospital to Be Enlarged.—The demands of the city as well as the needs that will arise from the war have made further hospital expansion necessary. To meet these needs the board of estimate has arranged for the purchase of the block to the north of the present hospital grounds, on which an addition to the present Bellevue Hospital will be erected.

Infantile Paralysis.—By the middle of July, 1916, 1,900 cases of poliomyelitis had been reported to the department of health, while thus far this year but seventy-seven cases have been reported. Attention has been called by a number of writers to the fact that an increased prevalence of poliomyelitis is frequently associated with or followed by an increase in the prevalence of epidemic cerebrospinal meningitis. The figures of the health department show that the amount of cerebrospinal meningitis occurring in this city at the present time is about normal.

PENNSYLVANIA

Smallpox at Hazleton.—Ten cases of smallpox are reported at Hazleton. The patients are in the municipal hospital, and tents have been erected for convalescents.

Society to Hear About War Surgery.—The annual meeting of the Lehigh Valley Medical Society will be held in Buckwood Inn, Shawnee-on-Delaware, July 31. The program has been arranged on war surgery.

Personal.—Major Herbert Alonzo Arnold, M. C., Pa. N. G., Ardmore, has been commissioned lieutenant-colonel.——A commission as major has been given Dr. Jonathan C. Biddle, M. C., Pa. N. G., Fountain Springs.——Major Scott M. Huff, Milesburg, has been assigned to the First Cavalry, succeeding Major Allen W. Urmson, Newcastle.——Dr. Chapin Carpenter, Pottsville, has been appointed a member of the staff of Base Hospital Unit No. 34, Philadelphia.

Philadelphia

Death from Yellow Fever.—The Danish steamer *Bryssel* from Antilla, Cuba, for Philadelphia, was held at quarantine at Reedy Island, because of the death from yellow fever of a member of the crew. No other case has occurred on the steamer.

Money for Base Hospital.—The Hahnemann Hospital and College campaign to raise $50,000 with which to equip its hospital unit has passed the half way mark. The teams soliciting subscriptions or contributions reported, July 20, that $28,300 had been subscribed.

Red Cross Nurse Dies.—Miss Lydia D. Shrope, former head nurse at the Philadelphia General Hospital, who has been active in Red Cross work in France since 1914, and who was connected with the base hospital at LaPanne, Belgium, died from tuberculosis at Fort Bayard, N. M., recently.

Two Thirds for Physicians in Military Service.—The president of the Philadelphia County Medical Society writes that the statement made in THE JOURNAL, July 7, regarding the Philadelphia County Medical Society is incorrect. The society will give two thirds of all money collected by its members from patients of members who are in the military service, retaining one third to cover expenses.

Senior Physicians Elect Officers.—Physicians of Philadelphia above the age of 55 years held a meeting in the College of Physicians and Surgeons of Philadelphia, June 27, and organized the Senior Medical Men for Special War Service. The purposes of the organization were described by Drs. Hobart A. Hare, J. Chalmers DaCosta, and others. The following officers were elected: president, Dr. William W. Keen; vice presidents, Drs. John B. Deaver and James M. Anders, and secretary-treasurer, Dr. Christian B. Longenecker.

Army Physical Examinations.—The medical examinations of the National Guard mustered in the regular army showed a high standard of men. In the first physical examination only one man was rejected and this rejection was provisional on the result of a Roentgen examination. Those who passed the physical test included the line officers, the men of the battalion of the Sixth Infantry, the line officers and troops of the cavalry, and the officers and troopers of the E. A. D. and G. The officers attribute the high standard of the men to the training they received on the Texas border last summer, and also to the fact that no one is accepted who does not meet the requirements of the physical examination prescribed by the Army.

Base Hospital Unit Completed.—The final list of those selected for Base Hospital No. 20 of the University of Pennsylvania was announced by the examining board, July 20. The corps includes the commissioned personnel, regular nurses, nurses' aids and medical reserves. The commissioned personnel includes:

Majors J. B. Carnett, director; E. L. Eliason, chief of surgical section, and G. M. Piersol, chief of medical section; Capts. J. D. Zulick, chief of Roentgen-ray and laboratory section; D. P. Pfeiffer, surgeon; D. P. Willard, orthopedic surgeon; B. F. Baer, Jr., ophthalmologist; F. E. Keene, surgeon; J. H. Austin, physician; J. H. Musser, Jr., physician; F. H. Leavitt, neurologist, and T. Edwards, registrar, and First Lieuts., S. A. Brumm, laryngologist; A. Randall, genito-urinary surgeon; E. B. Piper, surgeon; W. Bates, surgeon; B. M. McIntire, physician; E. D. Hopkinson, physician; H. Goldsmith, physician; L. L. Clemens, physician; P. F. Williams, pathologist; A. C. Woods, bacteriologist; J. D. Owens, dental surgeon, and F. P. K. Barker, dental surgeon.

WASHINGTON

New State Society Officers.—In addition to the list of officers of the Washington State Medical Society, appearing in THE JOURNAL, July 7, p. 51, the following were elected: president, Dr. George M. Horton, Seattle; secretary, Dr. C. H. Thomson, Seattle, and assistant secretary, Dr. John H. O'Shea, Spokane.

Personal.—Dr. William D. Kirkpatrick, Bellingham, has been appointed director of a Red Cross hospital unit, and expects to be sent to the Roumanian front.——Drs. John R. Brown, Tacoma, and Henry H. McCarthy, Spokane, have been appointed members of the state board of health, succeeding Drs. Elmer E. Heg, Seattle, and Wilson R. Johnston, Colfax, respectively.

State Medical Aid Board.—The state medical aid board is districting the state for the operation of the new law which provides for the payment of physicians' bills, hospital fees and surgeons' expenses for injuries of workmen, and has issued a call for the election by workmen and employers of joint boards to handle the detail of aid extension. Each board will consist of one workman and one employer, and will be selected by the contributors' fund, which the state administers.

WEST VIRGINIA

Smallpox.—Four cases of smallpox have been discovered at Wheeling. Three of the patients are negroes.——Smallpox was reported, July 3, from Everson, Carolina, Ida May and Farmington. All of the patients are negro miners.

Trachoma in Two Counties.—The state department of health was notified, June 26, that there were a number of virulent cases of trachoma in Mingo, Wyoming County, and that the affected persons had refused to go to the Trachoma Hospital at Welch for treatment.

Personal.—Drs. Vincent T. Churchman, Charleston; Luther H. Clark, Kyle, and Hubert E. Gaynor, Parkersburg, have been appointed members of the state health council to succeed Drs. William W. Golden, Elkins; Will J. Davidson, Parkersburg, and Joseph E. Robins, Charleston, terms expired.

Sanatorium Overcrowded.—The state board of control is flooded with applications for admission of patients to the State Tuberculosis Sanatorium, Terre Alta. The present capacity of the institution is 120 patients, and a new building is under construction, which will accommodate fifty more.

CANADA

Hospital News.—A memorial hospital for soldiers who have gone to the war from Orillia, Ont., is to be erected in that town. It is proposed to raise $50,000 by subscription, and the building will be erected on the present hospital site as soon as the war closes.——The Brant House, a summer hotel at Burlington Beach, near Hamilton, Ont., has been commandeered by the Canadian Hospitals Commission as a hospital for returned soldiers.

Personal.—Capt. E. Fielden Nivin, C. A. M. C., who was attached to the Royal Army Medical Corps in France a year ago, has returned, and is now attached to the A. D. M. S. staff, Calgary, Alta.——Dr. William J. Wanless is home in Toronto from India on short furlough.——Lieut.-Col. Thomas B. Richardson, formerly in command of the Toronto Military Base Hospital, and latterly A. D. M. S., Sudbury, Ont., is now medical officer, British War Mission, Chicago.——Capt. W. Gerald Cosbie, Toronto, has been awarded the Military Cross for bravery at Vimy Ridge. Captain Cosbie is attached to the Eighth Canadian Field Ambulance.

Treatment of Returned Soldiers.—The special parliamentary committee which, for three or four months, has been investigating the subject of the care and treatment of returned soldiers, has reported to Parliament. As to the supervision of returned soldiers, two suggestions are made: A majority of the committee recommends the creation of a new department of the government, or a subdepartment under a minister of the crown, directly charged with the oversight of all measures dealing with the returned soldiers' problem. Three other members of the committee take the view that the militia authorities should have full charge. If neither of these recommendations finds favor with parliament, the committee advises that the medical treatment of returned men shall remain entirely under the control of the Army Medical Corps. The committee further advises that prompt measures be immediately taken by the federal and provincial authorities to deal effectively with the tuberculosis problems arising out of the war; that hopelessly insane soldiers be cared for at the expense of the federal government in provincial institutions; that any returned soldiers likely to transmit venereal disease should be quarantined at the port of entry until cured, and that orthopedic hospitals be provided at suitable centers throughout Canada, in addition to the one established in Toronto, and that such hospitals supply needed limbs free of cost, and renewals from time to time, at the expense of the state.

GENERAL

Tuberculosis Conference.—The fifth annual Mississippi Valley Conference on Tuberculosis will be held in Minneapolis and St. Paul, October 8 and 10, under the presidency of Mr. James Minnick, Chicago. The sessions of the first day will be held at the Hotel Radisson, Minneapolis, those of the second day at the State University, and those of the third day at the Hotel St. Paul.

Book for Mothers.—The Kansas State Board of Health has issued a book for mothers which is sent out as one of the bulletins of the board. The pamphlet, which was prepared by the Division of Child Hygiene, contains registration and health examination blanks, tables of weights and measures for different ages, chapters on prenatal hygiene, care of the new-born, directions and formulas for infant feeding, data on child development and lists of reference books and pamphlets.

United States Department of Justice Warns Against Court-Plaster.—When the newspapers reported last week that apparently an effort had been made in Kansas to disable and to kill through the distribution of court-plaster carrying tetanus germs, and attributed the undertaking to German agents, the story seemed so impossible that few serious minded people gave it credence. It seemed so diabolical and to be so remote from any military end as to be beyond belief. Further, from a medical point of view, such a method of transmitting disease is so impossible, at least so impractical, that few physicians would give it the slightest credence. Now, however, that the United States Department of Justice has thought it worth while to issue a warning against the use of court-plaster from sources not known to be thoroughly reliable, the matter has taken on a more serious aspect and physicians and people generally will do well to take no unnecessary risk. If infected court-plaster is on the market, it will make little difference to the user whether the contamination was due to the machinations of German agents or to purely accidental infection, and heed should be paid to the government's warnings. The statement given out by the United States Department of Justice on July 21 was as follows:

"While the Department of Justice does not take a sensational view of the reports indicating a possible enemy activity in the dissemination of poisoned sticking, or court-plaster, there has been enough officially reported on the subject to warrant thorough investigation, both as to the manner of distribution and the germs in the plasters.

"Consequently, the samples in hand are being analytically examined in Washington and in a Western city. Pending further information, it would be well for the consuming public to use no remedies of this kind, except those obtained from approved sources of supply."

FOREIGN

Advanced Surgical Station in the Italian Campaign.—The Italian Red Cross has fallen into line and established complete stations close to the firing line. Marro, Delaini and Cassano were in charge of the first one thus carried far forward during the recent offensive.

Prize for Pfaundler.—Our Netherlands exchange states that the O. Heubner prize, given in Germany for the best work on some phase of pediatrics published in the last four years, has been awarded to Professor von Pfaundler of Munich for his publications on the physical measurements of children.

Sanatoriums for Brazil.—A group of Brazilian physicians is forming a stock company, under the name of Emprezas Sanâtorios do Brazil, to establish and operate sanatoriums in different parts of the country. The first institution is to be located half way up the Itatiaya Mountain, near Rio de Janeiro.

Ascoli Appointed to Succeed Baccelli.—Prof. V. Ascoli of the chair of medical pathology of the University of Pavia has been appointed professor of clinical medicine at Rome to succeed Baccelli. Ascoli is editor in chief of the leading Italian weekly, the *Policlinico*, founded by Baccelli and Durante twenty-four years ago.

Exchange of War Prisoners.—The *Riforma medica* comments on the touching scenes at the border when the Swiss Red Cross train brought into Italy 646 Italian and Serbian incapacitated prisoners of war. They included forty-eight officers. The same train took back an equal number of Austrian prisoners of war incapacitated by wounds or disease.

Medal for Public Health Services.—The Harben gold medal of the Royal Institute of Public Health, England, given every third year for eminent services rendered to the public health, has been awarded this year to Surg.-Gen. Sir Alfred Keogh, G. C. B. director-general A. M. S., and the gold medal for conspicuous services rendered to the cause of preventive medicine to Dr. E. W. Hope, M. O. H., for the city and town of Liverpool and professor of public health in the university.

Calmette Succeeds Metchnikoff.—Albert Calmette, director of the Pasteur Institute at Lille, is 54 years old. He founded the Pasteur Institute in Indo-China and discovered there a ferment with which alcohol can be extracted from rice, but it was at Lille that he perfected the antivenom serum for snake bites. In the campaign against tuberculosis he was one of the pioneers, his preventorium being one among, if not the very first established. He has remained at Lille during the war, but has now been called to Metchnikoff's vacant place in the Pasteur Institute at Paris.

LONDON LETTER

LONDON, July 11, 1917.

The War

THE MEDICAL BREAKDOWN IN THE MESOPOTAMIA EXPEDITION

In previous letters to THE JOURNAL I have stated that, in marked contrast to the army medical service in France, that of the Mesopotamia expedition was defective. A sensation has been produced by the report of the commission appointed by the government to inquire into the operations in Mesopotamia, which has just been published. The expedition was under the direction of the government of India, and therefore Sir Alfred Keogh who, as director-general of the Army Medical Service has won unstinted praise, had no responsibility in this matter. The root of the failure was underrating the magnitude and difficulties of the expedition and in regard to the medical service in particular the providing of insufficient transport. The whole military outlook in India seems to have been confined to frontier warfare with savage tribes. When confronted with this new and greater problem, the authorities did not rise to the situation. The Mesopotamia expedition was not equipped in a manner suitable for campaigning in an unhealthy tropical climate against an enemy that was in alliance with and supported by the foremost exponents of modern warfare. The medical personnel was short even of the authorized scale, which in itself was insufficient. Each division was supplied with only twelve sections of field ambulance instead of the proper complement of twenty. This was due to personnel being retained in India for forces which might be required to meet internal disturbances or frontier warfare. No river hospital steamers were provided for what it was known must be largely a river campaign. Consequently until 1916 the sick and wounded had to use ordinary river transport steamers. These were always overburdened with ordinary transport work, were not infrequently used for carrying animals, and it was not always possible to clear them of their accumulation of filth before they were used for the wounded. No wheeled ambulance transport was provided. Ordinary army transport cars were the only vehicles for the sick and wounded, and their use for the latter involved inhumanity. A striking example of medical breakdown occurred after the battle of Ctesiphon, when over 3,500 wounded had to be removed from the battlefield to the river bank, in some cases a distance of 10 miles, without proper ambulance transport and with an insufficient medical personnel, food and comforts, so that a large proportion of the wounded had to make their way on foot in spite of their injuries. When they arrived at the river, the available steamer accommodation was gravely inadequate. They were crowded into steamers and barges without sufficient medical attention, appliances or conveniences. The majority went down to Basra, a journey from the battlefield which in some cases took as much as fourteen days. The discomforts of the wounded were aggravated by the presence on board of many patients with dysentery and other sicknesses. Major Carter, medical officer in charge of an ocean hospital ship, describes the arrival of a steamer packed with men thus: "When she was about 300 yards off, it looked as if she was festooned with ropes. The stench when she was close was quite definite, and I found that what I mistook for ropes were dried stalactites of human feces. The patients were so huddled and crowded that they could not perform the offices of nature clear of the edge of the ship, and the whole of the ship's side was covered with stalactites of human feces. A mass of men huddled up anyhow, some with blankets, some without, were lying in a pool of dysentery about 30 feet square. They were covered with dysentery and dejecta from head to foot." As I stated before, everything has now been changed in Mesopotamia, and with the turning of the military failure into a great success the medical arrangements have undergone a parallel improvement.

THE MEDICAL EXAMINATION OF RECRUITS

Before a committee of the House of Commons appointed to investigate the administration of the Military Service Act, Sir Alfred Keogh, director-general of the Army Medical Service, gave evidence which should be of interest now in America which is confronted by the same problem as we were three years ago—the rapid expansion of a small army never intended for the purpose of engaging in a great European war. Naturally, many mistakes are made. In the early days of the war, when public enthusiasm was at its height, it was not possible to establish any organized system for medical examination, and it was not until the Derby scheme that one was set up. In peace time we endeavored to employ regular officers in the work of examination, but such a course was not possible under the conditions, and, therefore, civilian medical officers were appointed. When war broke out men were taken for medical examination to local physicians, who could not possibly know the requirements of the service. The consequence was that a large number of men were recruited whom in peace time the authorities would not have thought of considering. This arose from want of knowledge of the army and of the duties of a soldier, and also from differences of opinion which, quite legitimately, were found among the physicians. Something, too, must be allowed for a certain amount of negligence or fatigue. Sir A. Keogh thinks that no physician can possibly examine more than forty recruits a day without doing himself and the service an injustice. When the war broke out every expert in the medical service had to be mobilized, and the system which had been instituted, under which medical inspectors of recruits were sent to centers at different times to see that individual physicians should endeavor to attain a common standard fell into abeyance. When Sir Alfred Keogh was recalled to the War Office he restored the medical inspectors of recruits and sent them all round the country, and by issuing instructions to every recruiting authority he endeavored to keep in check the disorder which existed. When Lord Derby suggested his group system of recruiting Sir Alfred Keogh adopted a system of boards for examining recruits.

Col. J. Galloway, who before the war was senior physician of Charing Cross Hospital, and is now inspector of medical recruiting boards, also gave important evidence. He considered that the keystone of a board is its president. At a time when the medical profession was being denuded of its members by reason of the war it was thought well that the president should be an officer, especially one who had served abroad and knew what soldiers had to do in the field. The predominating element of the boards consisted of civilian physicians acting generally from patriotic motives, doing very arduous and difficult work for pay quite inadequate, the maximum rate being $10 for a full day and $5 for a half day. Two methods of examining recruits are in vogue. In one a single medical examiner conducts the examination throughout, except in respect of such matters as those about which the advice of a specialist might be taken, and the examiner and the president then settle the man's classification. Frequent consultations between the examiners are encouraged and take place. A fuller and better type of examination is that in which, assuming that a board consisted of a president and four examiners, one examines the recruit's head and neck, a second his heart and lungs, and so on until, having passed before four examiners, the recruit goes before the president, who collates the opinions of the examiners and after consultation with one or more of them settles the classification. A large proportion of the difficulties are due to the medical profession having been asked to undertake an impossible task. In the old days of recruiting the examiner's task was simply that of passing picked men for service and rejecting all others. Now an examiner is burdened with the duty of placing men in at least seven categories and two unfit categories, besides certain subsidiary classes. Difficulties arise owing to the action of men who wish not to serve leads to "doping." In some cases the sputum has been infected from outside sources.

CASUALTIES OF THE AIR RAID

In consequence of the deaths of a number of persons previously reported as injured, and the discovery of additional bodies in clearing away débris, it is possible to give now a complete record of the casualties in the aeroplane raid on London, June 13. They are:

	Killed	Injured
Men	91	222
Women	24	110
Children	42	100
Total	157	432

UNITED STATES HOSPITAL UNITS ON THE BRITISH FRONT

Nearly 2,000 officers and other ranks of the United States Army Medical Service have now settled down to work in the British war zone. Six big British base hospitals have already been taken over in their entirety by as many units. The administrative staff of the average hospital unit consists of a major in chief command; an adjutant with the rank of captain, and a quartermaster who is also a captain. These are all officers of the regular army. The commissioned branch

of the professional staff consists of three majors, five captains, sixteen first lieutenants and a chaplain. The other ranks number sixteen sergeants, mainly drawn from the regular army, and 200 of the medically enlisted reserve, comprising corporals, cooks and privates of the first class. There are also sixty-four reserve nurses drawn from the great city hospitals of the United States. As the hospitals taken over were in full working order there was no necessity for them to bring equipment, although most of the medical officers have come provided with their instruments. They are unanimous in praise of the establishments handed over to them.

PARIS LETTER

Paris, July 5, 1917.

Personal

In the meeting held, June 19, the Académie de médecine proceeded to elect two foreign associate members. On the first secret ballot Dr. Soca, professor at the University of Montevideo, former president of the republic of Uruguay; was chosen by thirty-seven votes as against eleven for Professor Roux of Lausanne. On the second ballot Dr. Couto, professor of internal medicine at the Faculté de Rio-de-Janeiro, the former president of the Academy of Medicine of Brazil, was chosen by thirty-two votes as against eighteen for Professor Roux.

The administrative council of the Pasteur Institute of Paris met recently to name two new subdirectors in place of M. Chamberland, who died in 1908, and of Prof. Élie Metchnikoff, who died in 1916. On motion of Dr. Roux, director of the Pasteur Institute, the council unanimously appointed as subdirectors of the institute Dr. Albert Calmette, director of the Pasteur Institute of Lille, and Dr. Louis Martin, director of the Pasteur Hospital.

Sale of Alcoholic Beverages

The prefect of police of the department of the Seine has just signed a decree in accordance with which the sale at retail of alcoholic beverages to be consumed on the premises is prohibited in all cafés, restaurants or other drinking places wheresoever located, except within the hours corresponding to the two principal meals, which are fixed as follows, on the basis of two hours for each meal: from 12 noon to 2 p. m., and from 7 to 9 p. m. So far as women and minors under 18 years of age are concerned, the prohibition will be applicable during the whole time that such establishments are open. All liquor venders are prohibited from selling at retail alcoholic beverages to take along, of whatsoever nature, in quantities of less than 2 quarts of any given kind. The prohibition outlined above does not apply to: (1) wine, beer, cider, perry (pear cider) and hydromel; (2) liqueurs and artificial wines, as well as aromatic wines prepared without maceration with or distillation from substances containing essences or essential oils, provided they do not assay more than 18 per cent.; (3) sweetened liqueurs prepared from fresh fruits, provided they do not assay more than 23 per cent. Violators of this decree will be rigorously prosecuted in conformity with the law.

Ether Anesthesia

At one of the recent meetings of the Académie de médecine, Dr. Mériel, professor of the surgical clinic at the Faculté de médecine de Toulouse, presented a communication on this subject. The main point that he claimed to establish was that the pulmonary complications frequently brought on by ether anesthesia are avoidable if a careful technic is employed during and after anesthesia. Julliard had already published statistics on nearly 10,000 etherizations without untoward effects of this kind. Mériel declared that since 1909 out of 4,880 etherizations he had not noted a single grave complication; only occasionally in winter there had been a few benign cases of trachitis, which only rarely degenerated into bronchitis. As the result of long experience, Mériel was able to state that, if certain precautions are taken, ether anesthesia is not only easy to accomplish, but is also without any real danger, and is contraindicated only in the case of emphysematous and tuberculous patients, and can be employed even in operations about the face and neck.

Filiform Drainage

A report on filiform drainage was recently handed in by Dr. Mercadé to the Société de chirurgie de Paris. All ten patients to whom he had occasion to apply this drainage recovered rapidly and without cicatrices. His observations may be classified thus: three acute abscesses of the neck, cured in eight or ten days; three cases of tuberculous, suppurative adenitis, cured one in eight days, the second in twenty, and the third in thirty days; one hematoma of the leg, cured in twenty days; one fistula, supported by a drain, cured in nine days, and two abscesses, developed in the course of a suppurative arthritis of the knee, cured in ten days. Following these observations, Mercadé presented some general statements on the filiform drain, on the good results from the use of which I have already commented (The Journal, May 5, 1917, p. 1335). According to Mercadé, this method effects a continuous drainage of an abscess without the introduction of a voluminous foreign body and without a large incision. The natural curative process is consequently not interrupted, and when the flow of pus has stopped, the walls of the abscess unite in a few days without a scar, whereas the large incision made in connection with tubular drainage lengthens the time required for healing, and leaves conspicuous scars. The filiform drain acts, as it were, as a permanent evacuatory puncture. It allows the pus to escape and prevents the air and the dirt from entering; in short, it works like an ordinary check valve. On the other hand, the tubular drain evacuates poorly the thick pus. It lets air in, and it works like a check valve reversed. The evacuation of pus without air being permitted to penetrate into the pocket is of great importance, especially in the case of abscesses which an incision causes to become fistulous; whereas the evacuatory puncture, if properly done, generally cures them without fistulization. The principal advantages of filiform drainage, according to Mercadé, are the avoidance of the necessity of anesthesia, the simplicity and the rapidity with which the operative procedure is accomplished, the rapidity of the healing process and the absence of cicatrices.

In support of this communication, Dr. Chaput, surgeon of the Hôpitaux de Paris, declared that for several years past he had definitely renounced tubular drainage; that he had employed filiform drainage exclusively, and that this form of drainage had always given him results much superior to the results obtained from tubular drainage.

The War

The American Red Cross

A generous American has just placed at the free disposal of the American Red Cross the old Coislin palace, situated in Paris, at the corner of la place de la Concorde and la rue Royale, to serve as general headquarters. The commission will be installed here as soon as the apartments can be made adaptable to their new use, and the work that has been undertaken with this end in view will be pushed as fast as possible. The Commission of the American Red Cross owes it to the generosity of its friends that it is able to meet with its own funds all obligations imposed on it. It is now financially so situated that whatever money is raised in the United States by the collections during "Red Cross Week" and by the subscriptions and gifts which the commission may receive during the course of the war, it will be in a position to use entirely for the alleviation of suffering. Acting in harmony with the general headquarters of the American Army, it will provide the best of care and the highest degree of comfort possible for the troops that the United States shall send to France.

Americans Enrolled in the Legion of Honor

On the occasion of the celebration of American independence, the president of the republic, adopting the proposal of the president of the Council and the minister of foreign affairs, bestowed the cross of the Legion of Honor on several Americans of note, namely: To Mr. Whitney Warren, associate member of l'Académie française, and member of the American Relief Clearing House, was given the rank of "officer," and to Mr. Pratt, director of the American Relief Clearing House, and to Mr. Fitch, chief surgeon of the Franco-American Hospital of Saint-Valéry-en-Caux, was accorded the title of "knight."

Reinjections of Antitetanic Serum Before Operations

At two recent meetings, the Société de chirurgie de Paris discussed at length the question of giving reinjections of antitetanic serum to the war wounded before undergoing surgical operations. This discussion was taken up in connection with the communication from Dr. Silhol of Marseilles. Silhol has given in his service reinjections of antitetanic serum to eighty-five patients. All received, between 9 and

11 a. m., a first injection of 1 c.c. of the serum, and if there was no reaction a second injection of 10 c.c. was given between 2 and 4 p. m. Out of these eighty-five patients, nineteen developed more or less serious symptoms (itching, nausea, vomiting, weak pulse, headache, syncope, etc.). Silhol concludes from this that it would appear advisable not to attempt to treat patients indiscriminately with antitetanic serum at times of surgical intervention and application of dressings unless good and sufficient reasons exist which will compensate for the inconvenience and dangers of the antitetanic serotherapy, and that no one should consider himself either culpable or blamable if a case of tetanus occurs, after an operation, important or otherwise, on a patient who was not reinjected.

Dr. Riche, a surgeon of the hospitals of Paris, has called attention to the fact that the problem of the preventive efficacy of antitetanic serum has not been scientifically demonstrated. There are believers, disbelievers and skeptics. He places himself in the ranks of the skeptics, for, to his notion, the inefficacy has not been proved either.

Dr. Proust expressed profound surprise to hear Silhol still raise doubts as to the efficacy of the serum, and to note that Riche stated that its efficacy had not been scientifically demonstrated. Proust thinks it has been—at least empirically. All those who were witnesses of the frightfully numerous cases of tetanus at the beginning of the war, and who now view its almost complete disappearance, will likely proclaim their absolute faith in the serum. As regards secondary infections, after what he has seen as head of a surgical section, Proust believes he can safely say that when it is a question of the secondary removal of projectiles from an infected area, the reinjection of antitetanic serum is indicated. It is, it seems to him, practically a question of good judgment, since inoculation accompanied by reactivation is evidently almost always fatal. The importance of the result to be obtained must be regarded as greater than the inconvenience imposed by the at times unfavorable effects of the serum.

Dr. Delbet has observed two cases of tetanus resulting after the injection of antitetanic serum. One of these patients had received only one injection; the other had received two. The tetanus appeared several weeks after the injections. In both cases there were singular manifestations which one is not in the habit of observing in man, and to which Lumière has already called attention; the muscles with bulbar innervation were only slightly, and that tardily, affected. The contractions began in the member which was the seat of injury, and remained confined to this member for a long time, as if the toxin had mounted along the nerve fibers without extending throughout the whole system. Both patients recovered after receiving daily from 30 to 40 c.c. of antitetanic serum and from 1 to 1.2 gm. of phenol. The impression made on Delbet by these two cases is that the injections of antitetanic serum, although they were of old origin, modified the progress of the tetanus. Evidently, these patients were no longer sufficiently immunized, as is shown by the fact that they had tetanic symptoms; but it seems probable that they had preserved a partial immunity which modified the progress of the tetanus. As for the unfavorable symptoms resulting from antitetanic serum, they must not cause the abandonment of serotherapy, although the after-effects are certainly troublesome at times, and it would be desirable to be able to avoid them, or at least to lessen the chance of their occurrence; this, perhaps, will prove to be possible.

Dr. Fredet, surgeon of the hospitals of Paris, thinks that in order to solve this question it is indispensable to ascertain: (1) how frequent and how serious these cases of tetanus are which spring up in belated fashion, in spite of injection or a series of injections of antitetanic serum; (2) how frequent and how serious the after-effects resulting from reinjections of serum are. As for the first point, Fredet states that out of more than 1,000 surgical operations which he performed on the war wounded, after the lapse of considerable space of time since the first and only antitetanic injection, or since the series of injections, he had observed only one case of tetanus, and the progress of even this case was benign. On the other hand, since October, 1916, Fredet has subjected about fifty patients to reinjections before operating on them. He has not, however, observed any unfavorable results, not even Arthus' phenomenon, but he remembers a case of hypersusceptibility which he saw before the war. The patient was a young girl who had received, two years previously, an injection of antidiphtheritic serum, and who, after being subjected to a new injection of antitetanic serum by reason of a foot injury, showed anaphylactic symptoms of a rather serious nature.

Dr. L. Bazy, chief of the surgical clinic of the Faculté de médecine de Paris, lost recently one of his patients, who succumbed to tetanus in spite of three prophylactic injections; but he does not consider this fact an argument against the efficacy of antitetanic serum. The most evident cause of the effects of antitetanic serotherapy in checking the disease is the persistence of the tetanic focus. The above-mentioned patient had, besides war wounds, serious frost bites on both feet, and bacteriologic tests showed that the tetanic focus was localized on the surface of the frost bite on the left foot, from which the dead tissue was just beginning to slough off at the time the first symptoms of tetanus appeared. It is probable that the quantity of tetanus toxin secreted on the surface of this wound was considerably out of proportion to the doses of serum injected; and here, according to Lumière, is the principal cause of the examples of precocious tetanus (if they may be so termed), as the result of antitetanic injections. Another reason which would explain the prophylactic effects of serotherapy in general, and of antitetanic serotherapy in particular, is that the serum used is horse serum, and therefore a heterogenous serum; consequently, the protection which it confers on man is of infinitely shorter duration than the protection it gives to a horse, for the simple reason that its introduction into the human system has the effect of bringing about immediately the production of an antibody (horse antialbumin), the efficacy of which increases in proportion as the injections are renewed. Since the immunity conferred by the prophylactic injection is easily exhausted, it becomes possible to understand the delayed appearance of tetanus, long after injections of antitetanic serum have been given, and also why it appears at the very moment when tetanic inoculation occurs on the surface of wounds of more or less old origin, scarred over or otherwise, as the result of surgical intervention or some traumatism which liberates the spores confined in the encysted foreign bodies.

Dr. Thiéry notes the fact that the clash between the theory of insufficiency of the antitetanic serum as against too strong doses of toxin elaborated at the focus of infection, and the belief in the insufficient duration of the immunization due to the heterogenous nature of the serum with which we are dealing, gives rise to two modes of practice as applied by the supporters of antitetanic serotherapy: while Lumière asserts that the doses of serum should be increased considerably so as to give in two or three days up to from 190 to 200 c.c. and even more, Bazy thinks that, on the contrary, we can reduce the dosage more and more until we need inject only from 2 to 4 c.c. On the other hand, in order to be logical, knowing that the serum acts only on the circulating toxin and has no effect on the germs elaborating this toxin unceasingly at the focus of infection, why do these supporters of serotherapy not recommend the suppression of these germs by amputation of the member, an old mode of practice which at present seems to have fallen completely into disuse?

Dr. Potherat, surgeon of the hospitals of Paris, declares himself to be an ardent believer in antitetanic serotherapy, but that does not signify that he has a blind faith in it. There are cases, indeed, in which the serum appears to be entirely inefficacious. But, independent of whatever particular influence the fact that the serum is horse serum may have, is not the same thing happening here which happens in the case of antidiphtheritic serum? All powerful though the latter may be against pure diphtheritic pharyngitis or laryngitis, it is inefficacious against angina due, for example, to a streptococcus. In war surgery, when there are so many different micro-organisms invading the wounds and when conditions manifestly favor the development of the *Bacillus tetani*, may there not be some which would be an obstacle to the action instituted by the antitetanic serum? Potherat emphasizes the fact that the surgical intervention has an evident, even preponderant, tendency to bring about the manifestation of tetanus. Its appearance, even though delayed, in cases of persistence of foreign bodies, and its cure, by even the secondary removal of such foreign bodies, furnish a proof of this. From this we may conclude that when giving prophylactic injections and reinjections to patients, we must act subsequently as if we put no reliance in this medication, and must treat the wounds as soon as possible by the incision of recesses, the excision of dead tissue and the extraction of foreign bodies; in short, the bringing to bear of all means possible to rid the infected focus of the *Bacilli tetani*.

Marriages

WILBUR H. MINFORD, M.D., Hazleton, Pa., and King George Military Hospital, London, England, to Miss Mildred Brightmore, in London, England, June 2.

LIEUT. WILLIAM AMORY TAYLOR, M. O. R. C., U. S. Army, Portage, Wis., to Miss Zelia Cooper of Terre Haute, Ind., at Wheaton, Ill., May 27, 1916.

LIEUT. LEROY DILMORE SOPER, M. O. R. C., U. S. Army, Smyrna, N. Y., to Miss Valentine Evelyn Johnson, of Burlington, Vt., June 20.

VERNON WALKER LE MASTER, M.D., Sidney, Ohio, to Miss Helene Garmhousen of Lock Two, Ohio, at New Bremen, Ohio, recently.

LIEUT. DEXTER HATHAWAY WITTE, M. O. R. C., U. S. Army, Hartford, Wis., to Miss Margaret Habhegger of Watertown, Wis., July 7.

LIEUT. JOHN STEPHEN MCATEE, M. O. R. C., U. S. Army, Councils Bluffs, Iowa, to Miss Marie Callahan of Omaha, July 10.

LIEUT. HENRY STANLEY ROGERS, M. C., Kan. N. G., Topeka, to Miss Jean Frances De Hart of Bartlesville, Okla., July 9.

CAPT. ROBERT SKELTON, M. C., U. S. Army, Douglas, Ariz., to Miss Evangeline Bovard of Nogales, Ariz., July 12.

ANTHONY BASSLER, M.D., New York, to Miss Harriet M. Seeley of Renfrew, Conn., in Kingston, Ont., July 14.

CHARLES WADHAMS STEVENS, M.D., New York, to Miss Marion Duncan Paine, at Scarsdale, N. Y., June 30.

LIEUT. GEORGE MCLEAN, M. O. R. C., U. S. Army, to Miss Margaret A. Gunther, both of Baltimore, July 7.

FRED XENOPHON LILLY, M.D., Dawson, W. Va., to Miss Anna Helen Young of Hinton, W. Va., July 6.

GORDON WOOD HIGGINBOTHAM, M.D., to Miss Faye Adams, both of Liberal, Kan., at Hooker, Okla., July 5.

JAMES FRANCIS BRADY, M.D., Boston, to Miss Ethel Gertrude Costello of Cambridge, Mass., June 26.

JARRETT JEFFERY BILLINGTON, M.D., to Miss Cecile Harriet Nott, both of Enterprise, Okla., July 10.

CAPT. ELBERT CLARK, M. O. R. C., U. S. Army, to Miss Helen Johnson, both of Chicago, July 11.

LOUIS ALBERT PACKARD, M.D., Hibbing, Minn., to Miss Mildred Mandeville of Denver, June 19.

JACOB FRANK FRIESEN, M.D., Los Angeles, to Miss Florence Adora Huntingdon of St. Paul, recently.

Deaths

George Edward Walton, M.D., Daytona, Fla.; Bellevue Hospital Medical College, 1864; aged 77; assistant surgeon in the Army during the Civil War; lecturer on physiology in the Medical College of Ohio, Cincinnati, 1867; lecturer on materia medica in Miami Medical College, Cincinnati, in 1868; professor of principles and practice of medicine in the Cincinnati College of Medicine and Surgery, in 1869; president of the Cincinnati Academy of Medicine, in 1880, and president of the Volusia County Medical Society, in 1904; died at the home of his son, in Terre Haute, Ind., June 26.

Henry H. Doan, M.D., Philadelphia; University of Pennsylvania, Philadelphia, 1890; aged 49; a member of the Medical Society of the State of Pennsylvania and of the Association of Military Surgeons of the United States; Major, Medical Corps, N. G., Pa.; assistant medical inspector of the Philadelphia Bureau of Health from 1904 to 1915, and thereafter chief of the division of child hygiene and chief of the division of hygiene; died at his home, July 5, from nephritis.

James Walton Wood, M.D., Long Beach, Calif.; College of Physicians and Surgeons, Chicago, 1883; aged 61; formerly a Fellow of the American Medical Association; health officer of Long Beach from 1887 to 1898; a member of the local school board for nine years; director of the National Bank of Long Beach, and local surgeon of the Southern Pacific, Salt Lake and Pacific Electric railways; died at his home, July 5.

William Stone Woods, M.D., Kansas City, Mo.; Jefferson Medical College, 1864; aged 76; a practitioner of Middle Grove, Mo., from 1863 to 1867, and thereafter a merchant and later a banker; president of the National Bank of Commerce, Kansas City; one of the most successful and prominent business men and bankers of Kansas City; died in Excelsior Springs, Mo., July 5, from cerebral hemorrhage.

Francis M. Ridley, M.D., La Grange, Ga.; Tulane University, New Orleans, 1880; aged 59; a member and once president of the Medical Association of Georgia; president of the state board of medical examiners; once president of the Troup County Medical Society; chief surgeon of the Atlanta and West Point, and Macon and Birmingham railroads; died at his home, July 7.

Louis G. Armendt, M.D., Owensboro, Ky.; University of Louisville, Ky., 1886; aged 66; a member of the Kentucky State Medical Association; a member of the staff of the Owensboro Hospital; health officer of Daviess County, and a member of the Daviess County Draft Exemption Board; died at his home, July 8, from cerebral hemorrhage.

Lycurgus S. Null, M.D., New Haven, Ind.; Eclectic Medical Institute, Cincinnati, 1866; aged 77; formerly a member of the Indiana State Medical Association; a veteran of the Civil War; in 1880 a member of the state legislature, and two years later elected state senator for four years; died at his home, July 8, from organic heart disease.

Leonidas Strickland Ebright, M.D., Sharon Center, Ohio; Wooster (Ohio) Medical College, 1869; aged 72; a veteran of the Civil War; formerly a member of the Ohio State Medical Association; a member of the legislature from 1880 to 1882; died at his home, June 10, from cerebral hemorrhage.

William Keating Bauduy, M.D., Little Rock, Ark.; Missouri Medical College, St. Louis, 1886; aged 51; formerly a member of the Arkansas Medical Society; emeritus professor of psychologic medicine and diseases of the nervous system in Washington University, St. Louis; died at his home, July 1.

James Ambrose Jones, M.D., Lynn, Mass.; University of Vermont, Burlington, 1906; aged 52; formerly a Fellow of the American Medical Association; a member of the Massachusetts Medical Society; for ten years assistant city physician of Lynn; died at his home, July 3, from heart disease.

William Schmoeller, Houston, Texas; Memphis (Tenn.) Hospital Medical College, 1893; aged 61; formerly a Fellow of the American Medical Association; a member of the State Medical Association of Texas; a member of the sanitary corps during the Turko-Russion War; died at his home, July 6.

Wilbur Alden Hunt, M.D., Kettlersville, Ohio; University of Cincinnati, 1912; aged 29; died at his home in Kennedy Heights, Cincinnati, July 8, from rheumatism, resulting from exposure while on duty as a sergeant, Hospitals Corps, Ohio N. G., during the floods in Hamilton in 1913.

Joseph Miller Kells, M.D., Columbus, Ohio; Medical College of Ohio, Cincinnati, 1880; aged 59; in charge of the relief department of the Pennsylvania system, Columbus district, since 1893; died at his home, July 1, from pernicious anemia.

Charles Bush James, M.D., Denver; Kentucky School of Medicine, Louisville, 1891; aged 51; city physician and police surgeon of Denver; for ten years physician of Denver County; died in St. Luke's Hospital, Denver, July 9, from asthma.

Ulysses G. Senour, M.D., Cincinnati; University of Louisville, Ky., 1889; aged 52; formerly a district physician of the Cincinnati Health Department, and mayor of Pleasant Ridge; died at his home, July 7, from cerebral hemorrhage.

Edwin D. Farrow, M.D., Visalia, Calif.; University of Pennsylvania, Philadelphia, 1864; a member of the Medical Society of the State of California; for many years physician of Tulare County; died at his home, July 6.

Christopher Turner, M.D., Butte, Mont.; National University of Ireland, Dublin, 1897; aged 56; formerly a Fellow of the American Medical Association; surgeon to St. James' Hospital, Butte; died in Brooklyn, June 23.

Edgar Jehial Meacham, M.D., Richmond Beach, Wash.; Rush Medical College, 1879; for the last year physician on the steamer *Protesilaus*, in the British service; died in the Providence Hospital, Seattle, June 28.

Samuel D. Tobey, M.D., Council Bluffs, Iowa; University of Michigan, Ann Arbor, 1860; aged 80; a veteran of the Civil War; formerly a member of the Iowa State Medical Society; died at his home, July 8.

Homer F. Fort, M.D., Dickens, Neb.; Omaha Medical College, 1888; aged 61; for several years local surgeon for the Union Pacific System; died in a hospital in Omaha, about June 30, from arteriosclerosis.

Isaac F. Sweeney, M.D., Milton, Ind.; Medical College of Ohio, Cincinnati, 1866; aged 72; a member of the Indiana State Medical Association; a veteran of the Civil War; died at his home, about June 29.

Warren Joseph O'Hara, M.D., Hastings, Neb.; Rush Medical College, 1891; aged 50; a Fellow of the American Medical Association; died in St. Catherine's Hospital, Omaha, July 3, after an operation.

Louis Baumann, M.D., Jersey City, N. J.; New York University, New York, 1884; aged 54; a member of the Medical Society of the State of New Jersey; died at his home, July 10, from heart disease.

John Wesley Saucerman, M.D., Winslow, Ill.; Rush Medical College, 1863; aged 79; formerly a member of the Illinois State Medical Society; died at his home, July 2, from cerebral hemorrhage.

Francis W. Johnson, M.D., Utica, Ind.; Kentucky University, Louisville, 1904; aged 47; a member of the Indiana State Medical Association; died at his home, July 3, from heart disease.

George Henry McKeehan, M.D., Washington, D. C.; Washington (D. C.) Homeopathic Medical College, 1896; for many years a manufacturing pharmacist; died at his home, July 3.

Alison B. Bush, M.D., Weston, W. Va.; College of Physicians and Surgeons, Baltimore, 1893; aged 51; a Fellow of the American Medical Association; died at his home, June 30.

George W. Veach, M.D., Wilmette, Ill.; Western Reserve University, Cleveland; aged 93; for more than forty years a practitioner of New Castle, Pa.; died at his home, June 2.

William Harrison, M.D., Port Angeles, Wash.; College of Physicians and Surgeons in the City of New York, 1850; aged 97; died at his home, May 11, from senile debility.

John South Drake, M.D., Santa Fe, Mo.; Miami Medical College, Cincinnati, 1871; aged 76; a Confederate veteran; died at his home, July 10, from cerebral hemorrhage.

James A. Thomas, M.D., Owensville, Ind.; Louisville (Ky.) Medical College, 1884; aged 55; a Fellow of the American Medical Association; died at his home, July 2.

Michael Arthur Young, M.D., Indianapolis; Medical College of Indiana, Indianapolis, 1891; aged 58; was struck and killed by an interurban car in Indianapolis, July 10.

Edgar T. Cook, M.D., Hot Springs, Ark.; University of Louisville, Ky., 1884; aged 64; died in his office in Hot Springs, July 11, from cerebral hemorrhage.

Stephen Arthur Allen, M.D., Plymouth, Mass.; New York University, New York, 1879; for many years a practitioner of New Bedford; died at his home, June 22.

James P. McMillan, Medora, Ind. (license, Indiana, 1897); aged 74; for many years a practitioner and druggist of Jackson County; died at his home, July 7.

Robert S. McCray, M.D., Morristown, Ind.; Medical College of Indiana, Indianapolis, 1884; aged 59; died at his home, July 7, from kidney disease.

John J. Kane, M.D., St. Louis; Homeopathic Medical College of Missouri, St. Louis, 1871; aged 71; died at his home, July 3, from acute uremia.

W. L. Marshall, Longview, Texas (license, years of practice, Texas, 1907); aged 89; a Confederate veteran; died at his home, June 23.

Abram Milton Powers, M.D., Rootstown, Ohio; Eclectic Medical Institute, Cincinnati, 1869; aged 80; died at his home, June 23.

Edward M. Manning, M.D., St. Joseph, Mo.; Northwestern Medical College, St. Joseph, Mo., 1882; aged 78; died at his home, June 24.

George B. Moore, M.D., Strawtown, Ind.; Medical College of Indiana, Indianapolis, 1870; aged 75; died at his home, June 28.

Frank G. Jones, M.D., Cleveland; Homeopathic Hospital College, Cleveland, 1888; aged 50; died at his home, June 22.

Duncan McKellar, M.D., Hillsdale, Mich.; University of Michigan, Ann Arbor, 1876; aged 65; died at his home, July 7.

William L. Busby, M.D., Delta, Iowa; Bennett Medical College, Chicago, 1888; aged 58; died at his home, July 7.

Daniel W. Humfreville, M.D., Los Angeles; Medical College of Ohio, 1864; aged 74; died at his home, June 23.

William B. Ezell, M.D., Ezell, Va.; Atlanta, Ga., Medical College, 1861; aged 80; died at his home, June 29.

Correspondence

END MONOPOLY ON SALVARSAN

[Last week we commented on the fact that the Adamson bill had passed the House of Representatives and would, quite likely, soon pass the Senate; that it included a clause authorizing the Federal Trade Commission to grant licenses to citizens of this country to manufacture products controlled, through patents, by enemy aliens. Bearing on this subject is a letter to the Chairman of the Federal Trade Commission, which is of such importance, in that it states concisely certain facts, that we gladly give space to it.—ED.]

NEW YORK, July 19, 1917.

Hon. William J. Harris,
Chairman, Federal Trade Commission,
Washington, D. C.

Sir:—In view of the possibility of the enactment of the Adamson bill, providing for the licensing of foreign patents to American citizens, I beg to present a few considerations bearing on the subject of salvarsan. As a former president of the American Dermatological Association, a member of the Executive Council of the American Society for the Control of Syphilis, and one moreover whose life has been spent in the treatment of this disease, I venture to express the belief that I speak with a certain authority.

I need not dwell on the enormous prevalence of syphilis among all classes of the community, or on the inestimable value of salvarsan in its treatment. Nor need I refer to the great increase in this already prevalent disease that, according to universal experience, may be expected among the soldiers of the great army, whom we are about to enroll. The use of salvarsan has today become a vital necessity.

When it comes to the question of licensing this or that individual or corporation to manufacture this drug, it is important to bear in mind the fact that we are not dealing with wagon-wheels or tomato-cans. The ordinary dose of salvarsan contains enough arsenic to kill several people, and in its manufacture several arsenical compounds of extraordinary toxicity are likely to be produced, and must be guarded against or eliminated. In short, salvarsan, improperly made, may be a poison of tremendous virulence. It seems obvious, therefore, that the licensing of the manufacture of this drug should be granted only under the strictest precautions, under such security that the possibility of killing our patients with it is excluded. The individual practitioner cannot make the necessary tests. I venture to suggest that no salvarsan be permitted to be sold that does not bear the imprimatur of some such authority as the Public Health Service of the government.

Your commission is, of course, aware of the fact that for some time past the Dermatological Research Laboratories of Philadelphia have manufactured salvarsan and have rendered the country a service of incomparable value in supplying the drug at a time when the foreign supply was unobtainable. The Philadelphia salvarsan has commended itself to the profession, who have learned to value its therapeutic efficacy and its freedom from poisonous by-products. In point of fact, in regard to its freedom from poisonous admixtures, it has shown itself to be superior to the imported drug. It would be a distinct loss to the public if this laboratory were deprived of the right to continue to supply the drug, the more as the laboratory in question has notoriously not engaged in the manufacture of the drug from motives of gain, but mainly from the altruistic desire to conserve the use of this valuable drug for the American public.

The foreign owners of the patent rights and their agents in this country, on the other hand, have exploited the drug to the utmost; they have made the public "pay all the traffic would bear." There is an ethical side to this question which cannot be ignored in the midst of its legal and commercial aspects. The experimental work which resulted in the elaboration of salvarsan was done in the Speyer Haus of Frankfort—a scientific foundation established by a philanthropist of Frankfort for the benefit of humanity, very much like the Rockefeller Institute for Medical Research in the city of New York, though on a much smaller scale. Conceive for a moment the possibility of a discovery like salvarsan having been made in the Rockefeller Institute and then patented by Dr. Flexner and the profits of its sale devoted to private ends! But more, sir! Not only has this drug, discovered in a laboratory founded for the benefit of humanity, been used for private gain, but the gains which the patentees had made have been exorbitant and outrageous. They have abused their

monopoly; they have exacted blood-money from the poor for a product which on ethical grounds should belong to the poor without profit to the patentees. For a drug whose sole cost practically depends on the overhead charges of the laboratory and factory, into whose manufacture the chemicals that enter cost normally only a few dollars per pound, they have charged the public at the rate of more than $3,000 per pound!

It would be a calamity to grant to this same group of people, who have so shamelessly abused their legal privileges, the sole right to manufacture the drug. Since the war, under the plea of increased expenses for freight, etc., they have audaciously added over $700 per pound to the already high cost of the drug. The public has no assurance that, with their monopoly secured, this rapacious group will not even still further add to the burden which the sick poor has to bear.

Let the manufacture of salvarsan be thrown to any one competent to make it and let only that product be sold which passes the tests of a recognized authority. In this way, the price of this inestimable drug will be kept within reason and its therapeutic reliability assured.

A patent on this drug should never have been asked for, nor granted if asked. It is interesting to recall the fact that two of the greatest life-saving discoveries in the history of civilization, Jenner's vaccination against smallpox and Sir Humphry Davy's safety lamp for miners, were given to the world without thought of profit to the discoverers. On the other hand, von Behring, a German idealist who despises the "Dollar Amerikaner" patented his diphtheria antitoxin in Germany and was prevented from patenting it in this country only because Roux, a Frenchman, who had simultaneously worked out the same product, had given it freely to humanity before von Behring applied for exclusive rights. *Salus populi suprema lex!* Let it be shown, now that the war has created an opportunity, that salvarsan can be profitably sold for a dollar a dose or less, and the price is likely to remain reasonable thereafter.

I have the honor to remain

Respectfully yours,

S. POLLITZER.

QUALIFICATIONS FOR MEDICAL OFFICERS AND THE DRAFT

To the Editor:—May I say, though not in approval, that you show great restraint in answering the series of questions propounded by "a physician of Colorado" (THE JOURNAL, July 14, 1917, p. 128). Question 3 asks, "Is it possible for Seventh Day Adventists to get relief from duty, such as examining troops and such other work except caring for the sick, on Saturday?" How can you have patience with any man, presuming that he is in his right mind, who exalts petty denominationalism above patriotism and service at such a time as this? It sounds suspiciously as though your correspondent were at heart a pacifist. "Our denomination is planning," etc. What have *denominations* to do with this grim business of war? For myself, I wish you had answered the questions a little more vigorously.

G. ALDER BLUMER, M.D., Providence, R. I.

An Ode to Health.—Health of itself makes life a perpetual joy. Nothing daunts, nothing overawes, nothing discourages and nothing overpowers the man and woman possed of health. Health means not only vigor and energy of body, but also clarity and strength of mind; purity and beauty of soul. The healthy person dominates life instead of allowing life to dominate him. He scarcely thinks of his body as consisting of parts or as performing separate functions. To him the body is but one harmonious whole. He is a unit, a being, a man; complete, vigorous, perfect. To such a man work is a joy. He regards obstacles as but opportunities for testing his strength. He hardly knows what weariness is. He never experiences exhaustion. Merely to grasp his hand is a pleasure. To gaze into his eyes is a joy. To hear his voice is to feel a thrill pass over one. To peer into his mind serves as a stimulus to higher achievement. Health supplies the courage, the aggressiveness in life. Without health one is bankrupt regardless of what his financial capital may be. He becomes a cipher in the world of real men and women. If you have health, then, friends, cherish it, guard it and treasure it as you treasure life, for out of it are the issues of life.—Adapted from Sigmund Beldegreen.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

ANTIDOTE FOR PETROLEUM POISONING

To the Editor:—I would like to know the best antidote for coal oil poisoning.

JOSEPH CERNY, M.D., Wilber, Neb.

ANSWER.—Sollmann (Manual of Pharmacology, 1917 edition, p. 108) states that "when petroleum is swallowed, it produces narcotic effects similar to those of alcohol, with strong gastro-enteritis." It is toxic in proportion to the content of the more volatile products. The treatment recommended by Peterson and Haines (A Textbook of Legal Medicine and Toxicology, 1904 edition, **2**, 533) consists in washing out the stomach or administering emetics and the use of purgatives. In cases of collapse, warm baths with cold affusions are recommended; the usual respiratory and cardiac stimulants are also indicated.

Kerosene is not so toxic as benzin (gasoline) which is more volatile. The symptoms and treatment of benzin poisoning were discussed in THE JOURNAL, Nov. 15, 1913, p. 1832.

REDINTOL

To the Editor:—I have just received a circular in which some bombastic claims are made concerning Redintol. What is it?

J. E. D., Columbus, Ohio.

ANSWER.—Redintol is a paraffin mixture for the hot wax treatment for burns. It is one of the products of Johnson and Johnson, New Brunswick. The composition, as given in the circular, is "Paraffines 95 per cent. combined with Resina Palaquium and Oleum Picis Liquid," which means little, and, if we presume correctly, was so intended. Ordinary paraffin would be an effective and much cheaper dressing. Although many physicians would not readily recognize "Oleum Picis Liquid" as oil of tar, yet we venture that not one in ten thousand would know that "Resina Palaquium" is simply gutta percha. That a respectable firm such as Johnson and Johnson would stoop to such "patent medicine" methods of exploiting their wares is to be deprecated.

REPORT OF BRITISH COMMISSION ON VENEREAL DISEASES

To the Editor:—Can you tell me where I may buy, or who publishes the report of the British Commission on Venereal Diseases, parts of which you commented on in THE JOURNAL a few weeks ago?

HERMAN L. KRETSCHMER, M.D., Chicago.

ANSWER.—It may be obtained from Wyman and Sons, Ltd., 29 Breams Building, Fetter-Lane, E. C., London; price 1s. 1ld.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

HAWAII: Honolulu, Sept. 10-13. Chairman, Dr. R. W. Benz, 1141 Alakea St., Honolulu.

Utah January Examination

Dr. G. F. Harding, secretary of the Utah State Board of Medical Examiners, reports the written examination held at Salt Lake City, Jan. 5, 1917. The examination covered 18 subjects and included 100 questions. The percentage required to pass was 75. Two candidates were examined, both of whom passed. Three candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
College of Phys. and Surgs., Baltimore		(1915)	*
University of Oklahoma		(1916)	*

* No grade given.

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Rush Medical College		(1903)	Illinois
University of Nebraska		(1912)	Iowa
University of Pennsylvania		(1910)	Penna.

Porto Rico April Examination

Dr. Quevedo Baez, secretary of the Porto Rico Board of Medical Examiners, reports the written examination, held at San Juan, April 2, 1917. The examination covered 10 subjects, and 100 questions were asked. The percentage required to pass was 75. Twelve candidates were examined, of whom 8 passed and 4 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
George Washington University		(1916)	83
Atlanta Medical College		(1916)	75
Loyola University		(1916)	75, 75
University of Illinois		(1916)	79
University of Maryland		(1916)	84
Vanderbilt University		(1915)	75
Medical College of Virginia		(1916)	84.4
	FAILED		
Chicago College of Medicine and Surgery		(1915)	62
Bennett Medical College		(1915)	68.5
Loyola University		(1916)	65, 66

Iowa Reciprocity Report

Dr. G. H. Sumner, secretary of the Iowa State Board of Medical Examiners, reports that seven candidates were licensed through reciprocity at the meeting held at Des Moines, May 29, 1917. The following colleges were represented:

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Bennett Medical College		(1913)	Illinois
Rush Medical College		(1914)	Illinois
University of Michigan Medical School		(1916)	Michigan
John A. Creighton Medical College		(1906) (1913) (1915)	Nebraska
University of Nashville		(1907)	Missouri

Georgia April Examination

Dr. C. T. Nolan, secretary of the State Board of Medical Examiners of Georgia, reports that nine candidates were licensed by a special examination, held at Augusta, April 11, 1917. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Atlanta Medical College	(1917) 90.7, 92.5, 92.8, 93.7, 94.5.		
University of Georgia	(1917) 90, 90.4, 90.4, 93.6.		

Georgia May-June Examination

Dr. C. T. Nolan, secretary of the State Board of Medical Examiners of Georgia, reports the written examination held at Atlanta and Augusta, May 31-June 1, 1917. The examination covered 10 subjects and included 100 questions. The percentage required to pass was 80. The total number of candidates examined was 83, of whom 81 passed, and 2 failed. Twelve candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Birmingham Medical College	(1913) 80.7;	(1915)	85.9
University of Alabama		(1911)	87.6
Atlanta Medical College	(1916) 84.5; (1917) 80, 83.5, 84.1, 85, 85.6, 85.7, 85.9, 86.2, 86.2, 86.3, 86.3, 86.4, 86.6, 86.7, 86.7, 86.8, 86.8, 87.1, 87.3, 87.4, 87.6, 87.8, 87.8 87.8, 87.8, 88.1, 88.2, 88.3, 88.3, 88.4, 88.4, 88.5, 88.5, 88.7, 88.7, 88.8, 89, 89.1, 89.5, 89.7, 89.7, 89.9, 90, 90.4, 90.4, 90.5, 90.5, 90.5, 90.7, 91.1, 91.4, 91.7, 94.1.		
University of Georgia	(1917) 87.8, 88.1, 88.4, 90.2, 91.6, 92, 92.9.		
Chicago College of Medicine and Surgery		(1916)	83.6, 87.5
Loyola University		(1916)	81.3
Baltimore Medical College		(1897)	83.8
Tufts College Medical School		(1916)	85.7
Chattanooga Medical College		(1904)	87.9
Knoxville Medical College		(1908)	80
Meharry Medical College	(1915) 85.2; (1916) 81.9; (1917) 80, 83, 83.2, 83.2, 83.5, 84.5, 87, 89.8.		
	FAILED		
Southern College of Medicine and Surgery		(1913)	72.3
Meharry Medical College		(1916)	75

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Rush Medical College		(1892)	Missouri
Hospital College of Medicine		(1898)	Minnesota
Johns Hopkins University		(1912) (1915)	Maryland
University of Maryland		(1915)	Maryland
University of Michigan Medical School		(1915)	Michigan
Meharry Medical College		(1913)	Tennessee
Tennessee Medical College		(1909)	W. Virginia
University of the South		(1900)	Tennessee; (1906) Louisiana
Vanderbilt University		(1915)	Tennessee
Medical College of Virginia		(1908)	Virginia

Book Notices

THE OFFENDER AND HIS RELATIONS TO LAW AND SOCIETY. By Budette G. Lewis, A.B., Commissioner of Correction, City of New York. Cloth. Price, $2 net. Pp. 382, with illustrations. New York: Harper & Brothers, 1917.

In this book, Mr. Lewis utilizes his large experience as Commissioner of Correction in the City of New York as the basis for a serious discussion of the best method of handling this problem. As there is no one cause for criminal delinquency so no one method of treating the offender will result in his rehabilitation. Especially suggestive is the author's comparison of our treatment of the insane and the criminal. In former years, he says, the insane were treated largely by confinement, practically all afflicted persons being treated alike. Gradually special treatment for different classes was provided and special institutions were established, with the result that from 20 to 30 per cent. of those committed to the best hospitals for the insane are now either released as cured or put under the supervision of friends or relatives. With further study of delinquency, he anticipates the development of special treatment for different classes of cases and of remedial and corrective measures which will fit the individual either for release and the resumption of normal activities in society or for supervision and guidance by properly selected persons. Influenced by the present day emphasis of prevention rather than cure, he urges the inauguration of remedial measures even for children yet unborn, of child welfare stations, proper schools and training, social control during the development period, and other preventive methods. The court and the offender, the inadequacy of existing legal methods, the relative value of the probation and parole system, the indeterminate sentence, the various forms of institutional organization and administration as well as industrial training, and the teaching of trades and occupations in prison are carefully considered. The chapters on police supervision and the rôle of the police in suppression of crime are particularly interesting. The author especially emphasizes the folly of enacting laws simply as moral pronouncements in advance of sustaining public opinion. The appendix contains much interesting matter on self-government in institutions, probation work, state control, etc.

THE NATION'S HEALTH: THE STAMPING OUT OF VENEREAL DISEASE. By Sir Malcolm Morris, K.C.V.O., Member of Royal Commission on Venereal Diseases. Cloth. Price, $1.25 net. Pp. 152. New York: Funk & Wagnalls Company.

This is an account of the efforts that have been made and of the measures that, in the opinion of the writer, are necessary for the reduction and suppression of venereal diseases in England. While written especially for members of country, urban and rural district health boards and other sanitary authorities, it is equally suitable for general circulation. The problem is set forth without undue exaggeration or sensation. The question is discussed purely as a public health problem and the adoption of remedial measures from the public health rather than the moral or sentimental standpoint. While the statistics quoted are largely drawn from Great Britain, the arguments and conclusions are equally applicable to our own country. Regarding notification of venereal diseases, while admitting that there is a strong prima facie presumption in favor of it, Morris agrees with the royal commission in opposing any system of notification or reporting at the present time, holding that without the accompaniment of compulsory treatment, notification would merely furnish statistics of the incidence of these diseases without necessarily improving conditions. He agrees with the royal commission in feeling that better results may be obtained by education and the increase of facilities for diagnosis and treatment. He is also opposed to regulation, believing that the essential remedy lies in the employment of moral, educational and medical measures.

Social Medicine, Medical Economics and Miscellany

Treatment of War Wounds

Sir Almroth Wright (*Lancet*, 1917, **1**, p. 939) points out that the disposition of the microbes in war wounds is fundamentally different from that in ordinary surgical wounds. In war wounds the infection is disposed, in part, on lacerated raw surfaces and in part it is carried deep into the substance of the tissues. Moreover, the infected lacerated surfaces are left denuded of skin and exposed to injurious external influences; and the infection which is carried down into the tissues is left as a buried infection. Every infected dead space must be cut down on and evacuated. As a prophylactic measure, every space which would, if left to itself, become an infected dead space—that means every space occupied by an infected projectile or pieces of infected clothing or infected foreign bodies or devitalized infected tissues—must be similarly laid open and cleaned out.

In the treatment of the surface infection, he says, one must distinguish between the naked tissue surface made by the projectile, or section with a knife, and the granulating defensive surface, which after a time clothes the naked tissues. The former is a nonvascularized surface, and in this is a system of lymph spaces left without mechanical or biologic protection other than that furnished by the emigration of leukocytes and (till that stanches) by the outflow of lymph. And the naked tissue surface is not only ill defended against microbic attack, it is also peculiarly liable to damage and to physiologic deterioration of the kind which opens the door wider to such attack. Such a surface readily dries up; and drying means the closing down of the capillary circulation. Again, seeing that it is nonvascularized, a naked tissue surface will readily take cold, and by that both lymph outflow and emigration are arrested. And lastly, a naked tissue surface, if kept wet, will, as soon as the discharges become tryptic, readily undergo erosive digestion. Against all these forms of physiologic degeneration special provision should be made in the treatment of naked surface infections. A granulating surface offers much greater protection against microbic infection, and is much less subject to damage. The tissues are covered in by many layers of protective cells, the lymph spaces are sealed over, and there has been laid down immediately below the surface in newly formed vessels a very abundant blood supply. All this gives sensible security against massive microbic invasion from the surface, against the wound taking cold, and against erosive digestion.

To start in the case of an open wound with a sterile surface avails nothing. War wounds become heavily infected even when the wounds are drenched at the outset with the strongest antiseptics, such as undiluted phenol and concentrated solutions of iodin. The first item in treatment will be to get a clean surface. For that it will, in the case of the tryptic suppurating wound, suffice to wash away the tryptic pus. In the case of the desiccated slough covered wound one must get rid of the sloughs. The rational way to do that will be by cleansing digestion. Such cleansing digestion can be obtained by treating the wound with hypertonic salt solution. This will break down leukocytes, setting free trypsin, and then the free trypsin will rapidly, and especially rapidly if one lets the hypertonic salt undergo dilution, amputate the dead from the living tissues. The use of hypertonic salt solution achieves more rapidly, and with less risk of infection, what putrefaction and the destruction of leukocytes by microbes would spontaneously effect. The second item of treatment in each case will be to combat the infection which has found a lodgment in the lymph spaces in walls of the wound cavity. To deal with this wash out by an outpouring lymph stream, and this is obtainable by treatment with reinforced hypertonic salt solution. Hypertonic salt solution is required both for preventing the set-back due to interruption of treatment in transport, and also for remedial treatment.

A slight infection of a naked tissue surface may be treated by leaving the wound to heal up from the bottom, limiting oneself to such redressing as would prevent erosive digestion; or the surgeon may close the wound with the minimum delay. If the anatomic conditions permit, and the bacteriologic examination shows the wound surface to be practically uninfected, or if the wound is only a very few hours old and the implanted microbes cannot yet have grown out, the wound can, after removal of all dead and foreign matter, be closed immediately, the surgeon standing by to reopen the wound if symptoms of buried infection develop. If, on the other hand, bacteriologic examination shows that the wound surface is appreciably infected, or the history of the case makes this practically certain, then closing the wound would be violating all the principles of surgery. Microbic infection may be dealt with by the physiologic procedure. Physiologic salt solution, and zinc sulphate in 0.25 per cent. solution, and no doubt many other heavy metal salts in dilute solution are the sort of agents required. But what is, above all, essential to success in physiologic treatment of a surface infection is to be very assiduous in removing any leukocytes which may break down on the face of the wound. That is a question of maintaining intact the antitryptic power of the discharges.

A second method of procedure, the unreasoning antiseptic procedure, is to employ an antiseptic without laying stress on the assiduous cleansing of the wound surface and the maintenance of good physiologic conditions, without inquiring whether the antiseptic can, when brought into external contact with pus or an infected tissue, penetrate into it; and without asking whether the antiseptic hinders phagocytosis, or destroys the antitryptic power of the blood fluids, or permits or interferes with tryptic action. The third method of procedure is the combined antiseptic and physiologic procedure. The method of Carrel is such a method. The assiduous removal of corrupted and corruptible discharges is the primary desideratum.

Carrel's treatment Wright believes is not a *therapia magna sterilisans*. Regarded as an antiseptic method, it is a method of "fractional sterilization," requiring, say, at the rate of 12 douches a day, a series of 60 to 144 antiseptic douches; superadded to the antiseptic is a series of 60 to 144 physiologic attacks on the microbes—each such attack starting from an atryptic condition. While Carrel's work constitutes a very notable practical achievement, regarded as science, it comes short in the respect that adequate control experiments are lacking. Wright would not have us assume that when we have successfully combated a surface infection by a series of 60 to 144 therapeutic operations we have reached finality. And much less must we, from the fact that a treatment successfully combats surface infections, infer that it is also an effective treatment for infections which penetrate into the deeper tissues. It ought to come home to us instead, he says, that we must never look to find for quite different categories of wound infections, that is, for quite diverse conditions, any one routine (antiseptic or physiologic) treatment.

The Riddle of Life as Seen by the Chemist

The riddle of life has long engaged the interest of philosopher and scientist alike. Living beings are so complex both in function and in structure that few students venture beyond the broadest hypotheses in the attempt to understand the material background of vital phenomena. So far as life can be interpreted in terms of physics and chemistry, it has received considerable attention in the past two or three decades from students of so-called general biology. In an address of unusual vision, presented before the American Association for the Advancement of Science a few months ago, P. A. Levene of the Rockefeller Institute for Medical Research in New York (The Chemical Individuality of Tissue Elements and Its Biological Significance, *Jour. Am. Chem. Soc.*, 1917, **39**, 828) summarized certain features of chemical structure and chemical dynamics which he believes characterize living organisms or cells. The first of these relates to their permeability. This seems now quite definitely to depend on the behavior of the proteins toward the reagents that come in contact with them. The conclusion that the permeability of a living membrane is a function of its chemical structure is of preeminent importance. As Levene writes,

living organisms or cells maintain their existence owing to the capacity of their outer membranes for absorption from the outside world and for elimination from within. By the first process the cell obtains materials required for the synthesis of its structural and dynamic elements; by the second it relieves its fluids from unnecessary and cumbersome waste products.

Growth—another characteristic of living organisms—also now appears to depend on suitable chemical structure of the available structural products. Levene reminds us that the capacity for synthesis is developed to a different degree in different biologic forms. Plants and some bacteria are capable of synthesizing their body protein from carbon dioxid and ammonia. The higher animal organisms require as starting material for the synthesis of their proteins at least amino-acids. Only a few years ago, Levene adds, no distinction was made between the food value of individual proteins or individual amino-acids. It has often been pointed out in THE JOURNAL how the present day point of view has been changed. Recent work of Abderhalden, Hopkins, Osborne, and Mendel and McCollum has established striking relationships between the growth of an animal organism and the structure of the amino-acids available as foodstuff.

Another question arises with respect to what constitutes the specificity or individuality of living organisms. Is this, too, a phenomenon of chemical structure? This leads to a consideration of the chemical make-up of some of the principal tissues. Evidently the compounds which they have in common are not the likely carriers of the unique property of individuality. Levene points out that the conspicuous tissue components are proteins, carbohydrates, fats and their complex derivatives, nucleoproteins, glycoproteins and lipoids. There are also enzymes and, finally, the products of cell activity, hormones and extractives. No differences are as yet known for nucleic acids of individual tissues of animal origin, nor has any significant distinction between the lipoids derived from different tissues or different species been discovered. The carbohydrates and fats are at best to be regarded as stores of ready energy. Evidence of both chemical and biologic nature arguing for the existence of individual differences between protein of different species and of different organs and tissues of the same species has been reviewed in THE JOURNAL. For their hormones and enzymes, characteristic differences likewise unquestionably exist.

On the basis of such information to which he and other American workers have contributed in no small degree, Levene has summarized the following tentative conclusion: There is a group of substances, such as nucleic acids, lipoids and conjugated sulphuric acids, which occur in all tissues, all organs of all species, constant, invariable in their structure, present wherever life is present. They are indispensable for life, but carry no individuality, no specificity, and it may be just to accept the conclusion of the biologist that they do not determine species specificity, nor are they carriers of the mendelian characters. The second group of substances is that of hormones and enzymes. These possess an undisputed chemical individuality. They may be present or absent in one or more organs, in one or another species; but when present in organs of various species may preserve their chemical individuality. In other words, their chemical structure is not a function of species variation. Jacques Loeb attributes to them the rôle of carriers of the mendelian characters, such as sex, color and form. This view seems to be quite acceptable from the chemical angle of vision. Finally, Levene adds, a third group of substances comprises proteins. These seem to show differences of chemical structure with variation of species, and because of this, Loeb ascribes to them the rôle of carriers of species specificity.

It requires little critical insight to discover the great gaps in our knowledge in this field. Yet there is something inspiring in the constructive imagination of the chemical basis of life. Despite the discouragement which profound ignorance may harbor for an assiduous investigator, there is some encouragement in the thought, to quote Levene, that "long after the mystery of the electron and of the atom will be solved, there will still remain the riddle of life to puzzle the human mind."

Medicolegal

"Ophthalmologist" and Optometry

(McNaughton vs. Johnson (U. S.), 37 Sup. Ct. R. 178)

The Supreme Court of the United States affirms an order denying the complainant an injunction to restrain the enforcement of the California statute regulating the practice of optometry, but which provides that it shall not be construed to prevent duly licensed physicians and surgeons from treating the human eye. The court says that the complainant claimed to be a regularly graduated ophthalmologist, which is a school of scientific learning and practice confined to the treatment of the inflammation of the eye and its membranes and in fitting glasses to the human eye; that she did not employ either medicine, drugs or surgery, nor was there anything in her practice hurtful to the individual or dangerous to society, and that there was no law in the state of California prescribing an examination for and regulating the practice of ophthalmology. She charged that the act regulating the practice of optometry offended the Fourteenth Amendment of the Constitution of the United States in that it deprived her of her property without due process of law and denied her the equal protection of the laws; and as specifications of the last she instanced the exemption from the provisions of the act of licensed physicians and surgeons; the appropriation to the sole use of registered optometrists of the right to employ any means other than the use of drugs in the measurement of the powers or range of vision; the denial to all other schools of scientific learning and practice the right to measure the range of human vision other than by the use of drugs on equal terms with the physician and surgeon; and contended generally that her occupation being a lawful one, not hurtful to the individual or dangerous to the community, the state had no power to impose discriminatory regulations on it. It is established that a state may regulate the practice of medicine, using this word in its most general sense. The complainant tried to escape from the rulings of those cases by which that is established by asserting a discrimination against her. She was an ophthalmologist, she averred, as above stated. She attacked the statute because, to use the language of her counsel, it "arbitrarily discriminates against every other school of scientific knowledge and practice in favor of the school employing drugs in determining the accommodative and refractive states of the human eye." It undoubtedly does, but gives the name of the school that of "optometry" and its practitioners "optometrists." This court cannot suppose that any injury was done her by the difference in names, and yet she gave no other tangible ground of complaint. Whether they are different, and whether the difference is of substantial or unsubstantial degree, she did not inform the court. She practiced one of them in preference to the other, and for the practice of that one the state has declared that its certificate of competency is necessary. The state has such power.

Secretary of Corporation Contracting for Treatment of Injured Employee

(Wilson vs. St. Louis Envelope & Paper Box Co. (Mo.), 190 S. W. R. 979)

The St. Louis Court of Appeals affirms a judgment for $280 in favor of the plaintiff for professional services rendered by him as a physician and surgeon in attending one Brune who was injured while in the employ of the defendant, the part of the plaintiff's bill ($150) for the first two days or covering the "first aid treatment" having been compromised between the plaintiff and a casualty company at $100, while the suit was pending before the justice of the peace before whom it was commenced. The court says that the plaintiff testified that a day or two after Brune was under his care in the hospital and after he had given him the emergency treatment, he called up the place of business of the defendant and talked with some one, whom he could not then identify, and as a result of that conversation continued the treatment. As

the plaintiff could not identify the person with whom he had this conversation, he was not permitted to give it. However, it afterward appeared from the testimony introduced by the defendant that the person with whom the plaintiff had had the conversation was the secretary of the defendant company, and the plaintiff was then permitted to give his version of that conversation. His version was, that calling on the telephone a day or two after Brune was injured, he asked for one of the members of the defendant company and was told that he was talking to the secretary. He told the secretary that he was treating Brune for the fracture; that gangrene of the foot and leg had developed; that the chances were the foot would have to come off, and that he would like to have some one who was interested notified, telling the secretary that it was going to be a long drawn out and critical condition and he would like to know to whom he should look for his compensation, etc.; that the secretary then said that they would not be responsible for the treatment and that he (the plaintiff) would have to look to Brune, but finally said, "Go on until you hear from me." Never hearing anything further from the secretary or from any one else connected with the defendant, the plaintiff continued the treatment until a cure had taken place. The secretary, on his part, positively denied making any such statement, and two or three other witnesses, who testified that they were present when this conversation took place over the telephone, testified that they heard the secretary's part of it and that he had not made the statement in that conversation testified to by the plaintiff. The court considers that this presented substantial evidence in favor of the plaintiff. The witnesses being before the court, seen and heard by the latter, it was for the court, trying the case as a jury, to determine their credibility and the weight to be given to their testimony. The secretary of the defendant had authority to make the contract of employment, and having made it, if he did, and so the trial court found, it carried with it an implied promise to pay the reasonable value of the services rendered thereunder. A rehearing was denied.

Society Proceedings

COMING MEETINGS

Michigan State Medical Society, Battle Creek, Sept. 4-6.

AMERICAN PEDIATRIC SOCIETY

Twenty-Ninth Annual Meeting, held at White Sulphur Springs, W. Va., May 28-30, 1917

(*Concluded from page 235*)

Accidents in Foreign Protein Administration

DR. CHARLES GILMORE KERLEY, New York: A boy who had suffered from asthma since 2 years of age was sensitized to ragweed, goldenrod, maple and horse serum. His parents fearing the consequences, if it should ever be necessary to give him antitoxin, desired to have him immunized to horse serum. He was given horse serum in one-half minim doses, and these were gradually increased, the treatment being given at intervals of two weeks, until 4 minims were given. This dosage was followed by a violent anaphylactic reaction. Recovery was slow but complete. The second child was sensitized to wheat, oats and barley. One day after receiving treatment she suffered an anaphylactic reaction just after leaving the office. In the third case the child responded to the scratch test for milk. Eight drops of Walker-Gordon milk caused the child to go into collapse. She also made a good recovery.

DISCUSSION

DR. FRITZ B. TALBOT, Boston: The first of these patients was sensitized to horse serum by anaphylaxis. If we want to sensitize a person we inject the foreign protein once in two weeks; if we wish to immunize him we give the injections every third or fourth day. That would explain the reaction in the first case. It is curious that many children react to the emanations of the horse and not to the serum. The horse serum protein is probably in both the serum and the excreta, while there is probably another protein in the emanations of the horse which is not in the serum. The second case that reacted to wheat, oats and barley brings up the interesting problem of mass reactions. When there is a tendency to react to one group of foreign proteins, particularly in the vegetable world, there is also a tendency to react to the other members of that group. We have found a peculiar thing: if, for instance, wheat produces a reaction and barley does not, if we stop giving wheat and give barley all will go well for two weeks, then the barley will cause a reaction and the wheat will not do so. The feeding of foreign proteins is safer than giving them subcutaneously. We have no fatal cases on record from giving the protein into the gastro-intestinal tract, but in cases in which the proteins have been given under the skin there have been fatalities.

DR. B. RAYMOND HOOBLER, Detroit: I have found that if we give the proteins by the mouth in tablet form, we can obtain desensitization with safety. We have just been making a series of tests. When we have produced desensitization, a little of the protein to which the patient has been immunized must be given daily until immunization is complete. We have been making injections by rectum in that type of patients not able to take cow's milk without developing an erythematous eruption. One may give milk by the mouth, reducing it to a very small quantity and giving it with other foods, and by giving these small quantities and very gradually increasing the amount, one may after three or four months obtain desensitization. In this type of cases one may, by means of a small rubber bulb, introduce an ounce of milk by rectum every day without trouble.

DR. J. P. CROZER GRIFFITH, Philadelphia: Can we regard all the reactions of this kind as protein reactions? For instance, would you regard a reaction to strawberries as a protein reaction?

DR. FRITZ B. TALBOT, Boston: It seems to me that we can explain all these reactions under the one head of protein reactions. There is no proof that there is anything else that causes anaphylaxis. All vegetables contain some pure protein, though in some the amount is very minute.

DR. GODFREY R. PISEK, New York: There is one practical point which should be emphasized, and that is that it takes a longer time than has been mentioned to produce immunity in some instances; sometimes it takes as long as six months.

DR. DAVID M. COWIE, Ann Arbor, Mich.: Attention has been called by Professor Novy to the possibility of overcoming anaphylaxis by rendering the urine alkaline by the administration of potassium acetate. We have had a large number of patients with eczema improve under antianaphylactic treatment.

DR. ALFRED FRIEDLÄNDER, Cincinnati: Among our patients who have received large doses of alkali there has been a greatly diminished incidence of serum disease following the use of the serum treatment.

DR. CHARLES GILMORE KERLEY, New York: The discussion has wandered far from "accidents." Altogether I have treated 107 patients and have had but few accidents. I have merely reported these cases to demonstrate that in the matter of protein therapy and in our experiments with foreign proteins our procedures should be very carefully carried out.

Chylothorax in an Infant

DR. GODFREY R. PISEK, New York: Ten days previous to admission to the hospital this baby had had a convulsion. There was nothing in the history to account for the condition. The child was 2 months and 1 week old. There were no symptoms except rapid and difficult breathing. Except for distinct areas of flatness over the right chest posteriorly with corresponding diminution of breath sounds and slight displacement of the heart, the physical findings were negative. A pleural effusion was suspected. At aspiration, 6 ounces of milky fluid were withdrawn. The laboratory examination showed that this was apparently a true emulsion, composed of fat and seroglobulin. The roentgenogram showed an

effusion in the right thorax with some displacement of the heart and mediastinal contents to the left. There was partial collapse of the right lung. The baby was allowed to go home after twenty-two days, being then in good condition and gaining in weight.

Sarcoma of the Brain Simulating Hydrocephalus

DR. L. EMMETT HOLT, New York: The parents first noticed enlargement of the head when the child was 2 weeks old. At 7 weeks of age the head measured 21½ inches in circumference, while the chest measured 15 inches. The only symptoms were those of ordinary hydrocephalus and hernia cerebri. At necropsy the right hemisphere of the brain was found to be quite normal, but the left was the seat of a large sarcomatous growth. The unusual features of this case were the absence of symptoms other than those of hydrocephalus, and the extraordinary rapidity of growth of the tumor.

DISCUSSION

DR. CHARLES GILMORE KERLEY, New York: I had a similar case in a child 8 or 9 months of age. The symptoms were those of hydrocephalus. An oculist and a neurologist could find nothing else, and the diagnosis of hydrocephalus was made. At operation a sarcoma was found. The child was operated on a second time, and died within twenty-four hours after the operation.

Value of the von Pirquet Test as Controlled by Necropsy Findings

DR. J. H. MASON KNOX, Baltimore: This article is abstracted in THE JOURNAL, this issue, p. 311 (see next column).

Effect on Human Milk Production on Diets Containing Various Forms and Quantities of Protein

DR. B. RAYMOND HOOBLER, Detroit: Twelve different diets have been tested. We have found that: 1. A nutritive ratio 1:6 or narrower seems best adapted to the need of nursing mothers. 2. Animal protein is more suitable than vegetable protein in supplying nitrogen for milk and maintenance of the nitrogen balance. 3. The protein when derived from nuts and when fed with other vegetable protein is suitable for supplying milk protein and for maintaining nitrogen balance. 4. A diet composed exclusively of cereals, fruit and vegetables does not supply sufficient protein for elaborating milk protein, and causes a severe drain on the tissues of the mother. 5. Of the various forms of animal protein, that derived from cow's milk seems particularly suitable for the production of human milk protein as well as for the preservation of maternal tissues. A diet that will just maintain the nitrogen equilibrium is in many respects preferable to one which tends to add weight.

Indicanuria in Children

DR. H. M. MCCLANAHAN, Omaha: A careful study of the urine of 536 children, varying in age from 4 to 12 years, was made; none of these children had any organic disease. Of this series, 20 were hospital patients, 6 of whom were suffering from empyema. All were subjected to operation. Indican was found in excess in all. In five who recovered, indican either disappeared or there was only a trace when they left the hospital. In the 516 ambulatory cases indican was present in greater or less degree. In 97 there was a trace of indican; in 367 indican was present in excess, and in 52 the urine was loaded with indican. Of the 516 cases, 337 on a second examination showed either a decrease or absence of indican, and in the remaining 179 the indican persisted. Of the 52 cases showing excessive indican, all were cases of constipation. Eleven patients, with the complete cooperation of the mothers, were placed on a diet eliminating entirely meat, eggs and milk for a period of ten days. After this treatment, and a free bowel movement daily, the urine of each child, without exception, showed absence of indican. It may be said that indican is present in the urine of the majority of children. A trace is probably normal: Excessive indican is evidence either of intestinal putrefaction or of some mechanical injury to the mucosa, or to some suppurative process within the body.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

July, XIV, No. 1

1 *Focal Lesions Produced in Rabbit by Colon Bacilli Isolated from Pyelocystitis Cases. H. F. Helmholz and C. Beeler, Chicago. —p. 5.
2 *Twenty-Four-Hour Metabolism of Two Normal Infants with Special Reference to Total Energy Requirements of Infants. F. B. Talbot, Boston.—p. 25.
3 *Some Analyses of Vegetables Showing Effect of Method of Cooking. A. M. Courtney, H. L. Fales and F. H. Bartlett, New York.—p. 34.
4 *Enlargement of Thymus Treated by Roentgen Ray. A. Friedländer, Cincinnati.—p. 40.
5 *Value of Von Pirquet Test as Controlled by Necropsy Findings. J. H. M. Knox, Jr., Baltimore.—p. 47.
6 *Intravenous Glucose Injections in Infancy. C. H. Dunn, Boston. —p. 52.
7 *Postoperative Acid Intoxication. J. C. Jeans and M. R. Johnston, St. Louis.—p. 57.
8 *Intussusception of Bowel in an Infant. A. Peskind, Cleveland. —p. 63.

1 and 2. Abstracted in THE JOURNAL, July 14, pp. 146 and 147.

3. Abstracted in THE JOURNAL, July 21, 1917, p. 233.

4. **Thymus Treated by Roentgen Ray.**—Three distinct facts are emphasized by Friedländer with reference to enlargement of the thymus: (1) The condition is much commoner than is ordinarily supposed. (2) The diagnosis can be made definitely by means of simple physical examination and the Roentgen ray. (3) In the Roentgen ray one possesses a therapeutic agent, which, in and of itself, will effect a cure in the vast majority of cases. Quite a few of his cases have occurred in babies suffering from congenital syphilis. A distinct familial tendency has also been noted as well as an apparent relationship of hypertrophic stenosis of the pylorus and enlarged thymus.

5. **Value of Von Pirquet Test as Controlled by Necropsy Findings.**—It may be concluded from the results reported by Knox that the von Pirquet test is a most reliable aid in the detection of tuberculosis in children; that a positive reaction indicates invariably a tuberculous focus in the body; and that a persistently negative reaction establishes the fact that there is no tuberculous lesion, except in those extremely ill patients where the presence of tuberculosis can readily be established by physical examination.

6. Abstracted in THE JOURNAL, July 14, p. 145.

7. **Postoperative Acid Intoxication.**—The acetone bodies of the blood were somewhat increased after operation in about two-thirds of the children studied, by Jeans and Johnston the maximum amount being found in most instances about twenty-four hours after operation. The plasma carbonate was reduced in about two thirds of the cases, the greatest reduction occurring in most instances about twenty-four hours after operation. When more closely compared there was found to be no close relation between the increase of acetone bodies and the reduction of plasma carbonate. In most instances, especially in those cases in which the plasma carbonate was much reduced, the acetone bodies were entirely inadequate to account for the degree of reduction of plasma carbonate. The undetermined acid factor was apparently of much greater importance than the acetone bodies in the reduction of reserve alkali. The starvation incident to operation seems to play no part in the production of this undetermined factor.

8. **Intussusception of Bowel in Infant.**—An interesting feature in Peskind's case was the obstruction of the bowel with a second intussusception within three weeks after the first operation.

American Journal of Medical Sciences, Philadelphia

July, CLIV, No. 1

9 *Results of Deep Roentgen Ray Treatment in Two Hundred and Fifty-Eight Cases of Malignant Tumors. A. F. Holding, New York.—p. 1.

10 *Syphilitic Aortitis; Report of Cases. A. R. Elliott, Chicago.—p. 14.
11 Congenital Absence of Lung; Report of Case. A. G. Ellis, Philadelphia.—p. 33.
12 *Use of Immune Serum in Treatment of Whooping Cough. A. Bleyer, St. Louis.—p. 39.
13 *Auricular Fibrillation; Some Clinical Considerations. S. A. Levine, Boston.—p. 43.
14 *Typhoid Meningitis; Report of Case. S. Bayne-Jones, Baltimore.—p. 55.
15 *Visceral Findings in One Hundred Syphilitics. T. Howard, Brooklyn.—p. 64.
16 *Pulsating Spleen in Mitral and Tricuspid Diseases. M. Manges, New York.—p. 72.
17 Rate of Excretion of Three Nitrogenous Waste Products, Uric Acid, Urea and Creatinin in Nephritis, as Shown by Comparative Studies of Blood and Urine. C. K. Watanabe, New York.—p. 76.
18 Clinical Study of Chlorid Excretory Function. C. C. Wolferth, Philadelphia.—p. 84.
19 Familial Epistaxis; Report of Case. H. B. Richardson, Boston.—p. 95.
20 Diagnosis of Early Pulmonary Tuberculosis. J. I. Johnston, Pittsburgh.—p. 100.
21 Influence of Renal Function on Hyperglycemia and Glycosuria in Diabetes Mellitus. A. A. Epstein, New York.—p. 103.

9. **Roentgen-Ray Treatment in Malignant Tumors.**—From a study of these cases by Holding it is evident that the Roentgen rays give excellent therapeutic results in basal cell epithelioma. They ameliorate cases of carcinoma of the breast, ovary and testis, tumors of lymphatic structures, especially when these tumors are made up of cells of an embryonal type. While one cannot successfully maintain that the Roentgen rays have yet proved to be a cure in cancer, it is worthy of note that these rays, as well as those of radium, applied with removal when possible, produce more uniform improvements in cancer than any other agents heretofore known, and the use of these agents in cancer is established until some effectual constitutional treatment for cancer is found. Pending the discovery of some effectual constitutional treatment, every effort should be made to increase the ameliorating effects of the radioactive methods. Surgery should not ignore the benefits of these methods in the treatment of cancer, particularly in the postoperative raying and treatment against metastases. Most of Holding's improved cases eventually relapsed, and while their lives were prolonged and made more comfortable by the Roentgen-ray treatment, they eventually died of the disease. In some instances these ameliorating effects were very striking and deserve particular attention in the hope that one may eventually discover means of making these ameliorations more lasting and even permanent.

10. **Syphilitic Aortitis.**—Of all the methods of diagnosis to determine the presence of aortic disease, Elliott says the Roentgen ray is the most valuable. By its aid one may detect slight changes in the caliber and shape of the vessel which entirely elude the methods of physical examination. It is obvious that until there is some dilatation, thickening, alteration of curve, or abnormal pulsation in the vessel, Roentgen diagnosis of aortic disease is impossible. In consequence of this fact the Roentgen ray cannot be relied on for its detection in the early stage before mechanical defects begin to make their appearance. Clinical considerations and the Wassermann test must establish the diagnosis at this stage.

12. **Immune Serum in Whooping Cough.**—For the purpose of determining the value of this method, injections of human blood were carried out by Bleyer in the early weeks of this disease in forty-five cases. These were divided into three groups of fifteen cases each. In Group A the blood injected was from persons who were convalescent or who had recovered from whooping cough within three months. In Group B the blood was from persons who had had the disease at more remote periods, and in Group C from persons who, so far as they knew, had never had it. The ages of the children in all groups averaged under 3 years. The stage of the disease at which the treatment was given was about the same in the three groups. Dosage was gaged in a rough way to body weight of donee, from one-tenth to one-fifth of the computed volume of blood of donee was given; this varied between 40 and 125 c.c., divided into two, three or four doses and injected into muscle (gluteus). Discoloration often followed the injections in very young infants; in a few there was induration for a day or two; there were no infections, and temperature reactions, so far as could be told in this disease, did not occur. The injections in every case were completed within a week in order to avoid hemolytic reactions; reactions to new proteins were not observed. The blood used was from a single donor in ten, from two in four, and from three in one. Blood not used at once was citrated to 1 per cent.

The results of the treatment in the three groups may be summarized: In Group A of fifteen children whose average age was 28 months, who received convalescent's blood during the early weeks of whooping cough, there occurred no deaths and no serious complications; the course of the disease was, however, in no definite way different than is usually seen, and was not appreciably influenced by the treatment except in three. In Group B, in one case, in which the blood used was from the mother who had had pertussis twenty years before, quite as satisfactory improvement occurred as in any case in Group A; in this group there were no pneumonias which recovered. There were also two pneumonias in Group C with one death, and in this group there was one case which seemed to have been very favorably affected by the injections of normal blood.

13. **Auricular Fibrillation.**—A study made by Levine of 128 consecutive cases of auricular fibrillation diagnosed by electrocardiograms, and of 261 consecutive necropsies, showed that the following general conclusions may be drawn. Auricular fibrillation is met with almost as frequently as lobar pneumonia. Syphilis plays an unimportant rôle in the etiology. The transient form is common but frequently overlooked. About one third of the cases of persistent auricular fibrillation have had one or more attacks of rheumatic fever or chorea and show clinical signs of chronic organic mitral endocarditis. Chronic organic mitral endocarditis is quite infrequently found in patients over 50 years of age, either in the living as a result of physical examination, or in the dead by postmortem examination. Most patients with organic mitral diseases develop mitral stenosis and only a small number reach the age of 50 years.

14. **Typhoid Meningitis.**—Bayne-Jones describes a case of purulent cerebrospinal meningitis due to *B. typhosus* occurring in the fourth week of a typical case of typhoid. The outcome was lethal within a few days after the onset of the meningitis. Statistics of the medical clinic of the Johns Hopkins Hospital show that out of 2,768 cases of typhoid there have been five cases of typhoid meningitis. Seventeen case reports of this relatively rare phase of typhoid infection are summarized from the literature on the subject. These, together, with the fifteen cases collected by Cole, and with the case reported by the author make a total of thirty-three proved accounts of the condition in the statistics of typhoid.

15. **Visceral Findings in Syphilitics.**—Howard's study emphasizes the fact that medical wards will be deprived of their present generous supply of syphilitic wrecks only when every syphilitic patient is treated early, thoroughly, persistently, and with painstaking consideration of his individual requirements.

16. **Pulsating Spleen.**—The case cited by Manges differs from those thus far reported. There was no evidence of aortic regurgitation, unless a short diastolic murmur in the third left space might be accepted as evidence of aortic regurgitation, of which, however, there was no other symptom, and there was no Corrigan pulse or double tone in the vessels; the tracings showed no sign of it; the hypertrophy of the left ventricle could easily be explained by the mitral lesion.

American Journal of Orthopedic Surgery, Boston

July, XV, No. 7

22 Function of Orthopedic Surgery in Present War. D. Silver, Pittsburgh.—p. 509.
23 *Transplantation of Hamstring Muscles for Quadriceps Palsy. S. Kleinberg, New York.—p. 512.
24 *Nailing Operation in Ununited Fractures of Neck of Femur. P. P. Swett, Hartford, Conn.—p. 521.

25 Treatment of Congenital Club-Foot. C. A. Stone, St. Louis. —p. 533.
26 Low Cost Motor Outfit. M. C. Harding, San Diego, Calif. —p. 542.

23. **Transplantation of Hamstring Muscles.**—This report is based on a study of twenty-three cases of infantile paralysis in which the inner or outer hamstring muscles were transplanted to the front of the knee, to supplement a weakened, or to take the place of a paralyzed, quadriceps. Twenty-one of these cases were operated on by Dr. Royal Whitman, and two by Kleinberg. Final results could be studied in only eighteen cases. Sixteen cases were seen one year of more after the operation. The ages of the patients varied from 5½ to 20 years. The time that had elapsed between the appearance of the paralysis and the date of operation varied from four to nineteen years. The results demonstrate that neither the age of the patient nor the length of time since the onset of paralysis has any bearing on the efficacy of the operation. Thirteen of the eighteen cases were biceps transplantations. In all of these there was gain of voluntary extension of the knee, varying from 10 degrees to complete and forcible extension. Of the five cases of inner hamstring transplantation, in three there was no gain in voluntary extension; in one case there was about 5 degrees of extension and that was doubtful, and in the remaining case there was 45 degrees of voluntary extension. From this review it may be concluded that, although the combined power of the inner hamstrings is much stronger than that of the biceps, nevertheless, when transplanted, the biceps acts more forcibly and is the muscle of choice for transplantation.

24. **Nailing Operation in Ununited Fractures.**—Swett calls attention to the effectiveness of the nailing operation for ununited fractures of the neck of the femur, and records the results obtained in eight such cases operated on by him.

Annals of Surgery, Philadelphia

July, LXVI, No. 1

27 Service in French Army Medical Corps. C. Chase, Brooklyn. —p. 1.
28 Roentgen Ray in War Surgery and Its Relation to Removal of Foreign Bodies. J. R. Eastman, Indianapolis, and R. B. Bettman, Chicago.—p. 13.
29 Use of Microphone for Removal of Needles in Hand. K. Bulkley, New York.—p. 19.
30 Deep Palmar Hand Infections. H. L. Beye, Iowa City, Iowa. —p. 24.
31 *Case of Laceration of Inferior Vena Cava; Repaired by Suture; Recovery. H. P. Cole, Mobile, Ala.—p. 43.
32 Two Cases of Intrapericardial Traumatic Hemorrhage. G. B. Rhodes, Cincinnati.—p. 44.
33 Subcutaneous Injuries of Liver; Report of Ten Cases. J. M. Hitzrot, New York.—p. 50.
34 *Transperitoneal Sigmoidotomy for Removal of Tumors in Mucous Membrane. W. J. Mayo, Rochester, Minn.—p. 64.
35 Value of Roentgen Examination in Cholelithiasis. J. T. Case, Battle Creek, Mich.—p. 69.
36 Acute Perforation of Gastric and Duodenal Ulcers; Report of Thirty-Six Cases. E. G. Alexander, Philadelphia.—p. 72.
37 *Relation of Iliohypogastric Nerve to Radical Cure of Inguinal Hernia. A. V. Moschcowitz and H. Neuhof, New York.—p. 79.
38 Some of the Problems of Plastic Surgery. J. S. Davis, Baltimore. —p. 88.
39 Autogenous Bone Graft in Treatment of Fracture of Greater Tuberosity of Humerus. W. T. Davidson, Laredo, Texas.—p. 95.

31. **Laceration of Inferior Vena Cava.**—While separating dense capsule-like adhesions fixing a tumor to the lower thoracic vertebrae, Cole produced two longitudinal rents in the anterior surface of the inferior vena cava, one about 3.5 cm. and the other about 1 cm. in length. A very profuse hemorrhage was controlled temporarily by a gauze pack. The tumor was removed rapidly as the patient was almost exsanguinated. Both lacerations were quickly whipped over with a single stitch of fine catgut on a fine needle. The patient was pulseless at the end of operation, but was carried through a quite exciting twenty-four hours with intravenous saline, and was discharged from the hospital within three weeks with the abdominal wound practically healed.

34. **Transperitoneal Sigmoidotomy.**—For removing growths by transperitoneal sigmoidotomy, the abdomen is opened in the midline, suprapubically, and a Balfour self-retaining speculum adjusted. A moderate Trendelenburg with a pack gives good exposure. Mayo now seldom uses the exaggerated Trendelenburg, and in old and adipose persons he is especially cautious in this respect. The sigmoid is opened on the anterior longitudinal band as nearly opposite the tumor as possible, and the tumor is exposed, drawn through, and double clamped. The growth is removed with the cautery and the defect closed from the mucous side by continuous sutures of chromic catgut after the method devised by Pilcher for the excision of hemorrhoids, and covered on the peritoneal side with a few interrupted silk sutures. The incision in the sigmoid is then closed with continuous catgut and interrupted fine silk. Mayo then passes a red rubber tube up into the sigmoid beyond the line of sutures and fastens it with a catgut suture to the anus; this is left in situ for a few days to prevent gas pressure. Mayo has never applied this procedure to frank malignant growths, but for growths similar to papilloma it has been found most efficient.

37. **Iliohypogastric Nerve and Inguinal Hernia.**—Two successful experiments performed by Moschcowitz and Neuhof prove that the posterior part of the iliohypogastric nerve is a mixed nerve, that is, both motor and sensory. That part of the iliohypogastric nerve which is exposed in the conventional operation for the radical cure of inguinal hernia is purely sensory. The authors advise that part of the iliohypogastric nerve which is exposed in the conventional hernia operation is to be preserved, because there is no necessity for dividing it, and also because its complete division will be followed by a temporary anesthesia of the hypogastric region. After a while regeneration of the nerve occurs and the anesthesia disappears. The nerve should be protected from a careless inclusion in the suture line. Such a careless inclusion is likely to be followed by a neuralgic pain. A careless division of the nerve is not followed by a local paralysis of the internal oblique muscle and therefore has no bearing on the radical cure.

Boston Medical and Surgical Journal

July 12, CLXXVII, No. 2

40 *Analysis of One Hundred and Thirty-three Fractures of Spine Treated at Massachusetts General Hospital. J. B. Hartwell, Boston.—p. 31.
41 Classification of Hay Fever Pollens from Biologic Standpoint. W. Scheppegrell, New Orleans.—p. 42.
42 Artificial Pneumothorax. P. H. Ringer, Asheville, N. C.—p. 50.
43 Case of Pernicious Anemia in Syphilitic Treated with Salvarsan. L. G. Lowrey, Boston.—p. 52.

40. **Treatment of Fractures of Spine.**—From a study of 133 cases Hartwell believes that laminectomy is absolutely contraindicated (1) in patients in shock or who have received demonstrable injuries in addition to the spinal fracture and the cord injuries accompanying it; (2) in patients with fracture of the cervical spine whose respiration is embarrassed by paralysis of the intercostal muscles; (3) in all patients whose paralysis accompanied the accident, and was noted immediately after accident; (4) before the fourth day of convalescence, because in cases in which improvement takes place, such improvement cannot be expected to manifest itself before the fourth day; (5) in all patients who are improving under conservative treatment, and laminectomy cannot be expected to better conditions if improvement, once shown, comes to a standstill; (6) in patients whose vertebral fracture is unaccompanied by medullary symptoms; (7) in all patients who have received injuries in addition to the spinal fracture, and (8) in all patients with uncomplicated vertebral fracture, whose cord injury accompanied the fracture, until at least four days have passed—the minimum time for spontaneous improvement to manifest itself. Operative treatment in the present series has not shown better results than conservative treatment. Laminectomy is indicated in the rare cases of gradual onset of medullary symptoms, and in patients who, originally free from cord symptoms, begin to develop symptoms referable to the cord. Tenderness over the site of injury is the most frequent and reliable sign of vertebral fracture. Shock is not common in vertebral fracture, regardless of the accompanying cord lesion, and the presence of shock is indicative of complicating injuries. The

presence of priapism is a bad prognostic sign. Injury to the cord, where present, is an accompaniment of the spinal fracture in a very large majority of cases; not secondary to hemorrhage or edema or persisting bone pressure, which are of relatively rare occurrence.

Bulletin of Johns Hopkins Hospital, Baltimore

July, XXVIII, No. 317

44 Undergraduate Instruction in Tuberculosis. A. K. Krause, Baltimore.—p. 217.
45 *Mineral Metabolism of Experimental Scurvy of Monkey. C. P. Howard and T. Ingvaldsen, Iowa City, Iowa.—p. 222.
46 Johns Hopkins and Some of His Contemporaries. H. M. Hurd, Baltimore.—p. 225.

45. **Mineral Metabolism of Experimental Scurvy of Monkey.**—The authors' study of the intake and output of the inorganic elements in human adult scurvy and the experimental scurvy of the guinea-pig and the monkey did not yield sufficiently decisive information to warrant an explanation of the pathogenesis of scurvy.

Journal of Biological Chemistry, Baltimore

July, XXXI, No. 1

47 Fate of Inosite Administered to Dogs. I. Greenwald and M. L. Weiss, New York.—p. 1.
48 Citric Acid Fermentation of Aspergillus Niger. J. N. Currie, Washington, D. C.—p. 15.
49 *Uracil-Cytosin Dinucleotide. W. Jones and B. E. Read, Baltimore.—p. 39.
50 Guanin Mononucleotide (Guanylic Acid) and Its Preparation from Yeast Nucleic Acid. B. E. Read, Baltimore.—p. 47.
51 *Estimation of Chlorids in Body Fluids. V. J. Harding and E. H. Mason, Montreal.—p. 55.
52 Intravenous Injections of Beta-Hydroxybutyric and Aceto-Acetic Acids. R. M. Wilder, Chicago.—p. 59.
53 *Quantitative Estimation of Dextrose in Muscular Tissue. R. Hoagland, Washington, D. C.—p. 67.
54 *Blood Lipoids in Anemia. W. R. Bloor and D. J. MacPherson, Boston.—p. 79.
55 Studies on Enzyme Action. Further Experiments on Lipolytic Actions. K. G. Falk, New York.—p. 97.
56 Physiologic Behavior of Raffinose. S. Kuriyama and L. B. Mendel, New Haven, Conn.—p. 125.
57 *Rôle of Vitamins in Diet. T. B. Osborne and L. B. Mendel, New Haven, Conn.—p. 149.
58 Modifications of Colorimetric Determination of Uric Acid in Urine and in Blood. L. J. Bogert, New Haven, Conn.—p. 165.
59 Nutritive Value of Diamino-Acids Occurring in Proteins for Maintenance of Adult Mice. E. M. K. Geiling, Urbana, Ill.—p. 173.
60 Studies on Enzyme Action. Factors Influencing Proteolytic Activity of Papain. E. M. Frankel, New York.—p. 201.
61 Applications of Gas Analysis. Determination of Carbon Dioxid in Alveolar Air and Blood, and Carbon Dioxid Combining Power of Plasma, and of Whole Blood. Y. Henderson and W. H. Morriss, New Haven, Conn.—p. 217.
62 *"Vitamin" Hypothesis and Deficiency Diseases. E. V. McCollum and W. Pitz, Madison, Wis.—p. 229.
63 *Influence of Bile on Phenol Production. H. Dubin, Philadelphia.—p. 255.
64 Uric Acid Content of Blood of New-Borns. F. B. Kingsbury and J. P. Sedgwick, Minneapolis.—p. 261.
65 Hydrogen Ion Concentration of Ileum Content. J. F. McClendon, A. Shedlow and W. Thomson, Minneapolis.—p. 269.

49. **Uracil-Cytosin Dinucleotide.**—When nucleic acid is heated with ammonia it produces epinephrin uracil dinucleotide, evidently by hydrolytic rupture of its central nucleotide linkage. Jones and Read show that when nucleic acid is heated with mineral acid its central nucleotide linkage is not disturbed, but the two terminal nucleotide linkages are broken and uracil cytosin dinucleotide is formed.

51. **Chlorids in Body Fluids.**—An alternative method has been devised by Harding and Mason for the removal of the blood proteins, previous to the estimation of the chlorids, by the method of McLean and Van Slyke, which does not require the use of a highly specialized reagent. The method is said to be just as easy, simple and accurate as the original coagulation method. It is applicable to all the various body fluids. It is described in detail.

53. **Dextrose in Muscular Tissue.**—On account of its reducing action on Fehling's solution, creatinin is an important source of error in the determination of dextrose in muscular tissue. Creatinin is precipitated by an excess of phosphotungstic acid, and since that reagent is also an efficient precipitant for other nitrogenous constituents of muscular tissue as well, the use of phosphotungstic acid in excess has proved to be an excellent method for the clarification of a water extract of muscular tissue for the determination of dextrose by means of Fehling's solution. A method for the determination of dextrose in muscular tissue based on these principles is described by Hoagland. This method has proved to be simple in operation, and has yielded accurate results.

54. **Blood Lipoids in Anemia.**—The blood lipoid values in anemia were found by Bloor and MacPherson to be normal, or nearly so, as long as the percentage of blood corpuscles remained above half the normal value. When the percentage was below this level abnormalities appeared which, in the order of their magnitude and also of the frequency of their occurrence were (1) high fat in the plasma, (2) low cholesterol in the plasma and occasionally in the corpuscles, and (3) low lecithin in the plasma. The lipoid composition of the corpuscles was found to be normal in almost all cases. There was, therefore, nothing in their composition to indicate abnormal susceptibility to hemolysis. Removal of the spleen resulted in increased total fatty acids and lecithin in the corpuscles and of cholesterol in the plasma. The results were essentially the same whether the patients had anemia or not. The relation between free and bound cholesterol was found to be within normal limits in all cases of anemia except the two cases in which there was carcinoma, thus giving little support to the assumption that an abnormally great combination of cholesterol as ester is a factor in the production of anemia.

The low values for lecithin and the high values for fat, which were generally most marked in these cases in which the blood corpuscle percentages were lowest, are regarded as due to deficient fat assimilation in the blood resulting from the lack of sufficient corpuscles to bring about the change of fat to lecithin which has been found to be one function of the corpuscles. While the results offer no certain evidence that abnormalities in the blood lipoids are responsible for anemia, the low values for cholesterol, which is an antihemolytic substance, and the high fat fraction, which may indicate the presence of abnormal amounts of hemolytic lipoids in the blood, are possible causative factors of which further investigation is recommended by the authors.

57. **Vitamins in Diet.**—Experiments done by Osborne and Mendel confirm the presence in yeast of something comparable with the so-called water soluble vitamin. They offer no evidence regarding the presence or absence of the fat soluble one, since a liberal supply of butter fat was used in all of the food mixtures.

62. **"Vitamins" and Deficiency Diseases.**—McCollum and Pitz claim that the extensive experimental data at present available support the belief that the water-soluble B contains but a single substance which is physiologically indispensable, rather than a series of such substances, as is demanded by the "vitamin" hypothesis of Funk. Provisionally they have adopted this view, and predict that further inquiry will establish what is now all but demonstrated; namely, that unfavorable proportions among the well recognized constituents of the diet as well as of the two but recently appreciated ones, together with unsatisfactory physical factors and injury wrought through the agency of micro-organisms inhabiting the alimentary tract, will account for all the observed types of pathologic functioning which are referable to errors in the diet. They believe that there is satisfactory evidence in support of the view that polyneuritis is caused by a deficiency of a specific substance (water-soluble B) in the diet. They have repeatedly observed the curative effects of antineuritic preparations from various sources, when administered to polyneuritic birds or rats, and accept the explanation of Funk as to the etiology of this disease. This is, in their opinion, the only known deficiency disease" in the sense in which this term as been employed in recent years.

63. **Bile in Phenol Production.**—It is established by Dubin that in the absence of bile from the intestine, large amounts of phenol are produced, this increase being unaccompanied by an increase in the conjugation. The unchanged conjugation may be due either to impaired liver function, or a

gradual slow production of phenol, or to a combination of both. The increased phenol production in the absence of bile from the intestine is due probably to the increased decomposition of the intestinal contents brought about by the lack of digestive activity, and diminished inhibition of bacterial fermentative secretions.

Journal of Laboratory and Clinical Medicine, St. Louis

July, II, No. 10

66 Bacteriology of Poliomyelitis. H. Greeley, Brooklyn.—p. 671.
67 Newer Conceptions of Dementia Praecox Based on Unrecognized Work. H. I. Gosline, Trenton, N. J.—p. 691.
68 *Possible Derivation of Active Principle of Posterior Lobe of Pituitary Body from Tethelin Produced by Anterior Lobe. C. L. A. Schmidt and E. S. May, Berkeley, Calif.—p. 708.
69 *Studies on Properties and Action of Tethelin. C. L. A. Schmidt, Berkeley, Calif.—p. 711.
70 Means of Preventing and Treating Typhoid, Particularly in Armies, under Condition of War. F. P. Gay, Berkeley, Calif. —p. 719.
71 Preparation of Pure Sodium Phosphite as Antidote for Mercuric Chlorid Poisoning. G. A. Linhart, Berkeley, Calif.—p. 722.
72 *Traumatic Rupture of Heart; Report of Case with Uninjured Chest Wall. E. Kellert, Albany, N. Y.—p. 726.
73 *Acute Tuberculous Parietal Endocarditis. J. R. Stark, Cincinnati. —p. 731.
74 Description and Plans for Installation of Blast and Vacuum Pump. W. H. Walker, Chicago.—p. 737.

68. **Posterior Lobe of Pituitary Body.**—Having succeeded in splitting tethelin into products among which is a substance resembling in its action the active substance secreted by the posterior lobe, Schmidt and May believe that the active substance of the posterior lobe of the pituitary body is largely, or in part, derived from a splitting of the substance which is a product of the secretion of the anterior lobe and which contains an iminozolyl radicle.

69. **Studies on Properties and Action of Tethelin.**—The properties and action of tethelin, the active principle of the anterior lobe of the pituitary body, have been studied by Schmidt. It was found that tethelin is nonantigenic and nontoxic; hence its use therapeutically is warranted. It can not be used as the antigen in the Wassermann test, has no effect on the proteins of blood serum, does not cause a specific hyperleukocytosis, can be used as a medium for the growth of certain bacteria, is not split by trypsin or lipase, and does not stimulate contraction of the isolated cat or guinea-pig uterus.

72. **Traumatic Rupture of Heart.**—The case reported by Kellert is of interest since is serves to illustrate that extensive trauma to the heart may occur with little or no injury to the thorax. An Italian, aged 44 years, was engaged in digging in a sand bank. His fellow workmen, a short distance removed, heard him cry out, and on turning about, found that the bank had caved in and the patient was surrounded up to the waist by a large quantity of sand. He was unconscious, but apparently alive. When dug out, he was dead. The anatomic diagnosis was multiple ruptures of the heart; hemopericardium; rupture of the pericardium; hemorrhagic effusion of the left pleural cavity; subpleural hemorrhage; chronic pleuritis; chronic interstitial myocarditis; acute congestion of lungs and kidneys; small rupture of the left kidney; chronic peritonitis; chronic splenitis and perisplenitis; accessory spleen; superficial abrasions.

73. **Acute Tuberculous Parietal Endocarditis.**—The necropsy in Stark's case disclosed a chronic tuberculous spondylitis; psoas abscess; chronic tuberculous nephritis; chronic tuberculosis of the retroperitoneal glands; metastatic tubercles of the liver, spleen, right kidney, suprarenals and possibly cystitis and ureteritis; amyloidosis of the liver and kidney; cardiac dilatation; myocardial fibrosis; hypertrophied thyroid. Although this case, at first glance, might be considered one of generalized miliary tuberculosis, yet it presents many interesting features. The entire absence of any pulmonary or peritoneal involvement is unusual. The kidney lesion was evidently one of extension from the tuberculous spondylitis. Involvement of spleen and liver were minimal. About forty cases of tuberculous endocarditis are described, and only three of true tuberculous parietal endocarditis of which this case is one.

Journal of Nervous and Mental Disease, Lancaster, Pa.

June, XLV, No. 6

75 Metastasis of Cancer in Central Nervous System. I. Levin, New York.—p. 481.
76 Rôle of Consciousness in Development of Delusions. R. C. Hamill, Chicago.—p. 523.
77 Symptomatic Herpes Zoster. E. P. Boas, New York.—p. 531.
78 Wassermann Reaction in One Thousand Two Hundred and Sixty-Six Consecutive Admissions to Elgin State Hospital. E. W. Fell, Elgin, Ill.—p. 536.

Journal of Parasitology, Urbana, Ill.

June, III, No. 4

79 Endameba Buccalis. Its Multiplication and Periodicity. N. Nowlin, Lawrence, Kan.—p. 143.
80 Sporozoon Parasites of Fishes of Woods Hole and Vicinity. C. W. Hahn.—p. 150.
81 Study of Parasitic Protozoa. R. Kudo.—p. 163.
82 Occurrence of Bothriocephalus Liguloides Leuckart, with Especial Reference to Its Development. S. Yoshida. Osaka, Japan. —p. 171.
83 Life History of Gongylonema Scutatum. B. H. Ransom and M. C. Hall.—p. 177.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

July, X, No. 1

84 *Quantitative Experiments on Liberation of Epinephrin from Suprarenals after Section of Their Nerves, with Special Reference to Question of Indispensability of Epinephrin for Organism. G. N. Stewart and J. M. Rogoff, Cleveland.—p. 1.
85 *Influence of Asphyxia on Rate of Liberation of Epinephrin from Suprarenals. G. N. Stewart and J. M. Rogoff, Cleveland. —p. 49.
86 *Pharmacologic Studies of Ipecac Alkaloids and Some Synthetic Derivatives of Cephalin. A. L. Walters and E. W. Koch, Indianapolis.—p. 73.
87 *Agaricin. E. McCartney, London.—p. 83.

84. **Liberation of Epinephrin from Suprarenals.**—Further experiments made by Stewart and Rogoff indicate that the entire liberation of epinephrin from the suprarenals is controlled by nerves. In a number of acute experiments on cats and dogs, the reduction in the output of epinephrin after section of the various possible nerve paths to the suprarenals was studied. In all, epinephrin was still found in detectable amount in the blood coming from the suprarenals although the rate of liberation was reduced to a small fraction of the initial amount.

85. **Liberation of Epinephrin from Suprarenals.**—An attempt was made by Stewart and Rogoff to determine whether asphyxia produces a detectable increase in the rate of liberation of epinephrin from the suprarenals, as determined by testing suprarenal vein blood on rabbit intestine and uterus segments. The result was negative.

86. **Pharmacologic Studies of Ipecac Alkaloids.**—From an analysis of 145 different lots and samples of ipecac, representing in all many thousands of pounds of drug, the authors' records show that commercial ipecac averages 2.17 per cent. of total alkaloids. The lowest assay was 1.83 and the highest 2.84 per cent. The average amount of emetin is to that of cephalin as 63 is to 37. There is little or no difference in alkaloidal strength between Rio and Carthagena ipecac and the partition of the emetin and cephalin in the two species is in general the same. From experiments and case reports it would seem that the toxicity of emetin has generally been overstated. The usual dosage of 0.5 to 1 grain of emetin per day for six or eight days is certainly on the safe side unless the patient shows an unusual susceptibility to the drug. The real danger lies in the too long continued use of therapeutic doses, an entirely unnecessary procedure in the treatment of amebiasis, as the active endamebas will be destroyed by 0.5 or 1 grain doses in six to twelve days, and the encysted forms, if present, will not be destroyed by continued emetin injections.

87. **Agaricin.**—The results obtained by McCartney show that agaricin is a powerful poison for involuntary muscle, producing a marked and long continued rise of tone. It is suggested that this action affecting the muscular tissue surrounding the sweat glands prevents the secretion of the sweat, partly by more or less obstruction and by preventing peristaltic movements, and partly, perhaps, by limiting the blood supply.

Medical Record, New York

July 7, XCII, No. 1

88 History and Analysis of Methods of Resuscitation. S. J. Meltzer, New York.—p. 1.
89 Treatment of Hay Fever and Asthma by Pituitary Extract and Epinephrin. E. Zueblin, Cincinnati.—p. 10.
90 Recent Literature Pertaining to Vitamins; Their Application in Infant Feeding. L. Fischer, New York.—p. 13.
91 Infectious Arthritis. J. W. Torbett, Marlin, Texas.—p. 14.
92 Syphilis and Pregnancy. B. P. Thom, New York.—p. 16.
93 Complete Thrombosis of Abdominal Aorta; Report of Case. R. A. Keilty.—p. 19.
94 Variation in Character of Food Supply as Affected by War. J. M. W. Kitchen, East Orange, N. J.—p. 20.

Medicine and Surgery, St. Louis

June, I, No. 4

95 Advantages of Stereoscopic Method of Roentgenography Over that of Single Roentgenogram. E. G. Beck, Chicago.—p. 337.
96 Difficulties in Interpretation of Shadows in Roentgenograms of Kidney and Ureter Region. A. Hyman, New York.—p. 343.
97 Roentgen Examination of Chest. M. J. Hubeny, Chicago.—p. 354.
98 Roentgenotherapy in Malignant Tumors of Parotid Gland. C. A. Pfender, Washington, D. C.—p. 366.
99 Diagnosis of Bone Tumors. A. C. Christie, Washington, D. C.—p. 376.
100 Technic of Roentgenography of Kidneys. W. S. Lawrence, Memphis, Tenn.—p. 385.
101 Case of Syphilitic Pleurisy with Effusion; Resection of Rib with Drainage; Recovery. P. G. Skillern, Jr., Philadelphia.—p. 392.
102 Roentgen Ray Demonstration of Gallstone in Ampulla of Vater with Visualization of Common Duct and Right and Left Hepatic Ducts by Bismuth Injection. S. B. Childs, Denver.—p. 398.
103 Treatment of Malignancy by Radium. R. H. Boggs, Pittsburgh.—p. 401.
104 Roentgen-Ray and Radium Treatment of Leukemia and Hodgkin's Disease. I. Levin, New York.—p. 411.
105 Subphrenic Abscess and Its Treatment. S. S. Berger and M. E. Blahd, Cleveland.—p. 417.

Modern Hospital, St. Louis

June, VIII, No. 6

106 Cook County Tuberculosis Hospital, Oak Forest, Ill. H. L. Bailey, Oak Forest, Ill.—p. 377.
107 History of Occupational Therapy. W. R. Dunton, Jr., Towson, Md.—p. 380.
108 Remunerative Occupations for Handicapped. H. J. Hall, Marblehead, Mass.—p. 383.
109 Occupation and Diversion for Tuberculous Patients. A. T. Laird, Nopeming, Minn.—p. 387.
110 Beneficial Effects of Work Therapy for Insane. F. P. Clark, Stockton, Calif.—p. 392.
111 Potteries of Arequipa Sanatorium. P. K. Brown, Manor, Calif.—p. 394.
112 Occupation and Its Relation to Mental Hygiene. E. E. Thomson, Chicago.—p. 397.
113 Inoculation of Bacillus of Work. G. E. Barton, Clifton Springs, N. Y.—p. 399.
114 Occupation Therapy in Mental Hospital. A. H. Ruggles, Providence, R. I.—p. 404.
115 Work in Treatment of Insane Criminals. P. E. Bowers, Michigan City, Ind.—p. 406.
116 Some Principles of Occupational Therapy. E. G. Upham, Milwaukee, Wis.—p. 409.
117 Occupational Therapy in New York City Institutions. S. C. Johnson, New York.—p. 414.
118 Occupational Therapy at Muirdale. R. Horner, Wauwatosa, Wis.—p. 415.
119 Occupational Therapy in Dementia Praecox. E. Mabie, Napa, Calif.—p. 417.

New Jersey Medical Society Journal, Orange

June, XIV, No. 6

120 Gonorrheal Salpingitis; Its Consideration and Treatment. B. Bland, Philadelphia.—p. 217.
121 Roentgen Ray as Aid to Surgeon. A. A. Strasser, Arlington.—p. 224.
122 Some Gynecologic Problems Met in General Practice. G. E. Shoemaker, Philadelphia.—p. 236.
123 Gallbladder Infections. F. M. Donohue, New Brunswick.—p. 240.

New York Medical Journal

July 7, CVI, No. 1

124 Army Medical Service. T. H. Goodwin.—p. 1.
125 Function of Military Orthopedic Hospital. F. H. Albee, New York.—p. 2.
126 Medicomilitary Facts Developed by Experiences on European Battle Fronts. H. K. Loew, Fort Brown, Texas.—p. 5.
127 Distal Osteoporosis of Upper Extremity. D. J. Morton, Chevy Chase, Md.—p. 10.
128 Larva Migrans on Mexican Border. C. P. Gray, New York.—p. 15.
129 War and Nervous System. S. E. Jelliffe, New York.—p. 17.

New York State Journal of Medicine

June, XVII, No. 6

130 Poliomyelitis as Public Problem. A. Whitman, New York.—p. 259.
131 Epidemiology of Poliomyelitis. J. A. Conway, Hornell.—p. 264.
132 Epidemic of Poliomyelitis in New York State in 1916. M. Nicoll, Jr., New York.—p. 270.
133 Diagnosis of Unparalyzed Cases of Acute Poliomyelitis. A. Bowen, Rochester.—p. 274.
134 Treatment of Poliomyelitis with Immune Serum. E. Taylor, Burlington.—p. 279.
135 *Cancer of Bladder. J. A. Gardner, Buffalo.—p. 285.
136 Alkaline Carbonates in Urine. A. L. Benedict, Buffalo.—p. 289.
137 Syphilis of Nose and Throat. J. C. Beck, Chicago.—p. 290.
138 Outbreak of Diphtheria in Second Class City. P. B. Brooks, Norwich.—p. 295.
139 Soil Pollution Problem. V. G. Heiser, New York.—p. 298.

July, No. 7

140 What is Gained by Union of Obstetrics and Gynecology in Teaching Hospital? J. M. Slemons, New Haven, Conn.—p. 307.
141 Training of General Practitioner for Obstetrics. J. E. King, Buffalo.—p. 312.
142 Primipara Belongs to Expert and Hospital: Multipara to Family Physician and Home. R. H. Pomeroy, Brooklyn.—p. 314.
143 New Plan of Postgraduate Medical Education. W. S. Rankin, Raleigh, N. C.—p. 316.
144 Gynecology-Obstetrics as Department in General Hospital. Reasons and Results at New Greenpoint Hospital. E. Bishop, Brooklyn.—p. 323.
145 Pain Phenomena in Obstetrics. S. B. Blakely, Binghamton.—p. 328.
146 *Sarcoma Complicating Paget's Disease of Bone; Report of Case. L. Heazlit, Auburn.—p. 330.
147 *Melanotic Sarcoma of Small Intestine; Report of Case. E. A. Vander Veer and E. Kellert, Albany.—p. 335.
148 Some Phases of Present Treatment of Fractures. J. M. Hitzrot, New York—p. 338.

135 and 146. Abstracted in The Journal, June 9, p. 1779.

147. **Melanotic Sarcoma of Small Intestine.**—The first symptom in this case was a gradually increasing constipation, which required more and more powerful cathartics to relieve. The second symptom was a feeling of pain in the left upper quadrant, gradually becoming worse. Finally acute obstruction came on, the tumor causing an intussusception, and this intussusception was so severe as to cause the attending physician to consider surgical intervention. Aside from these symptoms (constipation and pain) there were practically none. A tumor practically filled the entire lumen of the ilium. Six inches of intestine was resected and an end-to-end anastomosis made. Patient returned to the ward and made an uneventful, though tedious, recovery. She lived very comfortably for about six months, when there appeared to be an extension of the growth in the lungs, and she succumbed to the latter condition.

Northwest Medicine, Seattle

June, XVI, No. 6

149 Congenital Pyloric Stenosis. D. Lewis and C. G. Grulee, Chicago.—p. 161.
150 Treatment of Goiter. B. T. King, Seattle.—p. 168.
151 Id. J. C. Moore, Seattle.—p. 172.
152 Surgery of Goiter. E. O. Jones, Seattle.—p. 175.
153 Belt Pin in Lung. C. A. Smith, Seattle.—p. 178.

Southwest Journal of Medicine and Surgery, El Reno, Okla.

June, XXV, No. 6

154 Duties in Prevention of Deafness. L. A. Newton, Oklahoma City.—p. 140.
155 Headache and Eye-Strain. D. R. Dorente, Fort Smith, Ark.—p. 146.
156 Differentiation between Upper (Central) and Lower (Peripheral) Motor Neuron Involvement. G. B. Fletcher, Little Rock, Ark.—p. 151.
157 Cholecystectomy. T. B. Hinson, Enid.—p. 154.
158 Undescribed Physical Sign of Portal Obstruction. E. H. Martin, Hot Springs, Ark.—p. 156.

Texas State Journal of Medicine, Fort Worth

June, XIII, No. 2

159 Relation of Medical Organization to Commonwealth. J. M. Ingc, Denton.—p. 44.
160 Physician in Politics. M. P. McElhannon, Belton.—p. 47.

Vermont Medicine, Rutland

June, II, No. 6

161 Twenty Years' Practical Experience in Obstetrics. T. Rice, Brattleboro.—p. 145.
162 Diabetes and Allen Treatment. W. H. Lane, Brattleboro.—p. 150.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

June 23, I, No. 2947

1 Work of British Pathology in Relation to War. F. W. Andrewes.—p. 829.
2 Bacteriology at Front. W. P. Herringham.—p. 832.
3 Trench Fever and Its Allies. W. P. Herringham.—p. 833.
4 Biochemistry and War Problems. H. D. Dakin.—p. 833.
5 Adaptation and Disease. J. G. Adami.—p. 837.

Medical Journal of Australia, Sydney

May 26, I, No. 21

6 No. 2 Australian Casualty Clearing Station in France. H. S. Stacy.—p. 437. To be continued.
7 Anaphylaxis; Its Clinical Significance. H. M. Mayo.—p. 440.

June 2, No. 22

8 No. 2 Australian Casualty Clearing Station in France. H. S. Stacy.—p. 457.

June 9, No. 23

9 Experiences in British Military Hospital. J. B. Dawson.—p. 479.
10 Army Dental Corps Work in Reference to Venereal Disease. B. Thompson.—p. 485.

Sei-I-Kwai Medical Journal, Tokyo

June, XXXVI, No. 6

11 Second Report on Action of Urea on Tetanus Toxin. H. Sewaki and Y. Tagami.—p. 39.

Annales de Gynécologie et d'Obstétrique, Paris

May-June, LXXII, pp. 513-576

12 *The Rights of the Child. A. Pinard.—p. 513.
13 *Indications for Symphyseotomy before Delivery. G. Fieux.—p. 518.
14 Determination of Date of Fecundation. P. Ancel and P. Bouin.—p. 527.
15 *The Quantity of Blood Lost at the Menses. A. Lahille.—p. 535.
16 Functions of the Corpus Luteum. C. Mulon.—p. 545. Continuation.

12. **The Rights of the Child.**—Pinard remarks that the first French Republic took as its standard the Rights of Man, and he pleads that the present republic should go on record as establishing the Rights of the Child. In the early history of man, he recalls, the child was safeguarded solely by the maternal instinct. "Given the mother's milk and maternal care, this ensures the perenneity of the human race." As soon as societies developed, the rights of the child were pushed to one side. Ten centuries before Christ, Hesiod counseled against the marrying of slaves, saying pregnancy and the care of the child interfered with the female slave's capacity for work. Pinard declares that the prevailing system (in France) of boarding out foundlings and other infants in the country is on a par with Hesiod's advice. The statistics for a recent week at Paris recorded 398 births and 141 infants boarded out, and 140 of these are to be fed from the bottle. The board paid is 35 francs a month for care with breast nursing, and 25 francs a month for bottle feeding. How many of the 140 will be alive next fall, he asks. The law provides, he continues, a *curateur au ventre*, to be appointed by the court when the unborn child stands in line to inherit property. Pinard urges that a *curateur au ventre* should be appointed for every unborn child that has reached the stage where the movements of its heart can be detected. This would entail compulsory notification of every pregnancy.

13. **Symphyseotomy.**—Fieux insists that the renaissance of cesarean section in recent years has not done away with symphyseotomy. The latter has always proved highly satisfactory in his experience; he has had no mortality in his twenty-one cases. Symphyseotomy enlarges the pelvis permanently while leaving the organs of reproduction intact, both anatomically and functionally. Its advantages over cesarean section are thus manifold in cases of flat pelvis with an obstetric diameter of only 8 or 9 cm. and the fetus not excessively large. His last series of six cases are described in detail, calling attention in particular to one case in which the four previous pregnancies had resulted in children stillborn or too much injured by forceps extraction to survive. In this case the symphyseotomy was done about the middle of the last month of the fifth pregnancy, and delivery at term proceeded spontaneously. The simplicity and ease of the operation thus preceding the childbirth by two weeks, the absence of hemorrhage back of the symphysis—which occurs almost constantly with symphyseotomy during labor—and the absence at this stage of any danger of infection, all commend, he reiterates, this antepartum symphyseotomy.

15. **Quantity of Blood Lost in Menstruation.**—Lahille describes the minute precautions taken to collect all the menstrual discharge in seven cases. Cotton compresses were used, and the distilled water in which they were soaked was evaporated and the iron in the residue determined. The iron content of the women's circulating blood was compared with this. The authorities mention varying quantities as to the blood lost, from Hippocrates and Galen's 600 and 500 gm. to the 120 or 240 gm. of the recent physiologies. Lahille's conclusions are that the amounts have been much exaggerated. Judging from the research related, 25 per cent. of the women do not lose over 20 gm. of blood in all; 50 per cent. lose from 50 to 55 gm., and 25 per cent. 65 gm. and more. He thinks that a tendency to abnormal conditions is suggested when the loss of blood is over 80 gm. The dry residue of 100 gm. of the menstrual discharge amounts to an average of 21 or 22 gm. Blood stains spread so rapidly that even a small amount of blood may give the impression of a large quantity.

Bulletin de l'Académie de Médecine, Paris

May 29, LXXVII, No. 22, pp. 683-712

17 *The Principle of Psychic Isolation in Treatment of "Functional Nervous Troubles." Landau.—701.
18 Action of Tin Oxid and Metallic Tin on Staphylococcus Infections. R. Grégoire and A. Frouin.—p. 704.
19 Case of Fatal Disease Simulating Acute Articular Rheumatism, Caused by Mycobacillus Synovialis. A. Chantemesse and others.—p. 708.

June 5, No. 23, pp. 713-754

20 Report on Diseases Prevalent during 1915 in French Possessions in Indo-China. Kermorgant.—p. 738.
21 *Bullet in Cauda Equina for Seventeen Months. V. Bellot.—p. 749.

17. **Treatment of Functional Nervous Trouble.**—Landau relates the details of three typical cases out of fifty in which he has successfully applied what he calls psychic isolation. He places the man with the functional nervous trouble in a room with men having a similar trouble of organic origin. The man is examined in the presence of the others, and every effort is made to have him see and appreciate the differences between his condition and the organic cases, the difference between the response to various tests, etc., comparing the findings in the various cases with those in his case. The man is thus confronted with himself, as it were, and the remarks of his mates with actual organic trouble, as they watch him, supplement the physician's words until the psychic isolation thus realized soon destroys the illusions he has been cherishing in regard to his case.

21. **Bullet in Cauda Equina.**—The bullet had evidently made its way between the fibers of the cauda equina without damaging them to any extent. The mildness of the symptoms led to the mistaken diagnosis of extradural location, and no attempt was made to remove the bullet. It was tolerated for months without apparent injury but the irritation from it finally set up infection and an operation the seventeenth month was unable to arrest the fatal myelitis. The operation on the cauda equina was done without mishap under local anesthesia, using a 0.5 per cent. solution of one part cocain to two parts stovain (Couteaud's mixture).

Lyon Chirurgical

March-April, XIV, No. 2, pp. 213-412

22 *War Wounds of the Larynx, Trachea and Esophagus. M. Lannois, A. Sargnon and A. d'Auriac.—p. 213.
23 Evolution of Traumatic Hemothorax. A. Policard and B. Desplas.—p. 240.
24 *Tardy Symptoms after Wounds of the Lung. E. Devic and V. Cordier.—p. 254.
25 *Treatment of Penetrating War Wounds of the Lungs. X. Delore and L. Arnaud.—p. 280.
26 *Indications for Early Operation for War Wounds of the Chest. V. Combier and J. Murard.—p. 312.
27 *Projectiles in the Lungs; Thirty-Nine Cases. (Projectiles du poumon.) L. Desgouttes.—p. 339.
28 *Foreign Bodies in the Diaphragm; Twenty-Five Cases. M. Patel and M. Papillon.—p. 356.
29 *Visit to Hospital in Charge of Depage. (L'ambulance modèle de la Panne-Océan.) G. Gayet.—p. 395.

22. **Wounds of the Larynx Region.**—In the experiences reviewed, among 2,830 men wounded in the neck and head, in seventy-six the larynx, trachea or esophagus or all combined were involved in the wound. This small proportion, scarcely 2 per cent., is explained by the high immediate mortality of such wounds. They are mostly shell wounds, and foreign bodies generally have to be removed by an operation from without. Cicatricial stenosis of the pharynx and esophagus can usually be corrected with progressive dilatation, as also slight stenosis of the larynx, but when there is much obstruction an operation from without is preferable. Aphonia from nervous inhibition in consequence of a war wound in the region, without apparent direct injury to nerves, is often extremely rebellious to treatment while hoarseness and other difficulties in speech generally subside under exercise of the vocal cords.

24-26. **Wounds of the Chest.**—Devic and Cordier were called on to pass judgment on the fitness for duty of ninety-seven men who had been wounded in the chest six months or more before and their wounds had healed. They usually found symptoms indicating pleural adhesions, but these and the functional disturbances seemed to be about the same whether the projectile was still in the lung or not. When the projectile is borne without trouble, they say, there is no need to extract it, as the ultimate findings are practically the same in the cases with and without removal of the projectile. They do not believe that these sequels or presence of a projectile are liable to entail tuberculosis later. However exact the localization and however skilful the surgeon, they would shrink from advising operative removal of a well tolerated projectile.

Delore and Arnaud review the lessons learned from seventy-one cases of war wounds. The outlook is reassuring provided the lungs were sound previous to the wound. The condition usually seems to be progressively improving, but time alone will tell.

Combier and Murard emphasize that the lung is exceptionally tolerant of foreign bodies and relatively resistant to infection. Hence expectant treatment with immobilization and morphin will suffice for small wounds. In fourteen cases they sutured the wound at once after cleaning and conditions rapidly improved in eleven of the cases; three of the patients died, and two required a secondary pleurotomy before final recovery.

27. **Projectiles in the Lung.**—Desgouttes advocates routine removal of the projectile unless it is in the hilus. All his fifty-two patients in this category recovered. He sometimes resected one or two ribs, and found roentgenoscopy a valuable aid when the projectile was deep in the tissues.

28. **Projectiles in the Diaphragm.**—On the basis of twenty-five cases, Patel and Papillon conclude that as the projectile generally gives little trouble in this region, its prompt removal is not called for unless the heart or phrenic nerve are menaced. No complications followed in any instance. The projectile can usually be reached between the pleura and the peritoneum.

29. **Depage's Model Field Hospital.**—The chief of the medical department of the French Army has sent a number of groups of army surgeons to la Panne, Belgium, to study the workings of what is regarded as a "model ambulance." Depage has had plenty of money at his disposal to perfect his equipment and ensure an ample personnel. Gayet gives a detailed description of the whole saying "the abdomens and the shockés" are kept at an advanced post, only 3 kilometers from the enemy. Extreme specialization is the rule, different sections being devoted to fractures, to neurology, to the eyes, ears, teeth, urinary organs and dermatology, wounds of joints, and of abdomen, skull and thorax. There are twenty-four operating tables. Gayet exclaims, "What an abyss between the surgery of 1914, which aimed only to save life and avoid compromising the member too much, and the surgery of 1917 which realizes in a few weeks, sometimes in a few days, the integral repair of the traumatism. For example, here is a fracture of the femur with crushing of the knee. In 1914 this would have meant death, unless possibly averted by a prompt amputation. In 1915 it would have meant resection with a usable ankylosis after about a year. In 1917, at la Panne, every remotest crevice of the wound is opened up, asepsis is realized in fifteen days or a month; then suture, with possibly bone and skin grafts, and the man is walking in three or four months and can be sent back to the front." . . . "And this triumph of surgery," he adds, "we do not owe to the Germans." The la Panne hospital has accommodations for 1,000 wounded. There are 140 nurses, including 80 English, 53 Belgian, 4 Danish, 2 Canadian and 2 French nurses; 80 orderlies, 7 artisans for making surgical instruments and 12 for artificial limbs, with photographers (including motion picture films and color photography), cooks, etc., to a total of 290 men. The Belgian army is said to pay for the upkeep of the hospital, the Red Cross for construction, etc., and the governments of the French and other Allies wounded pay for the days of care for their wounded. The total expense of the wounded per capita is about $1.60 per day. Part of the services are in the large hotel and cottages of the little watering place. The nurses are paid 5.50 francs a day, and their lodging costs them 1.50 francs and the table 3 francs, unless they prefer to live outside.

Lyon Médical

June, CXXVI, No. 6, pp. 253-300

30 Distribution of Anopheles Mosquitoes in Southeastern France. L. Léger and G. Mouriquand.—p. 253.
31 *Intravenous Injection of Colloids and Other Pseudosolutions. H. Busquet.—p. 262.

31. **Intravenous Injections of Colloids and Other Pseudosolutions.**—Busquet remarks that the list of colloidal metals and other pseudosolutions that have been administered for therapeutic purposes is already a long one. Theoretically, he says, it seems dangerous to inject foreign bodies into the blood, no matter how finely divided they may be, but his research on rabbits has shown that colloidal gold injected into a vein does not lake the blood until an amount has been injected corresponding to 1,400 times the therapeutic dose in man. Small doses, but still considerably larger than the therapeutic doses, do not notably modify the circulation. But crystalline gold, in the dose of 0.005 gm. per kilogram, promptly arrested the heart action in dogs and rabbits. Other experiences by himself and others are related demonstrating among other things that certain pseudosolutions, such as chaulmoogra oil, induce what he calls tachyphylaxis: The blood pressure drops after intravenous injection of 0.0001 gm. per kilogram but repeating the dose a few minutes after the return of the blood pressure to normal fails to modify the blood pressure in any way. A practical point emphasized is that most of the pseudosolutions send the temperature up considerably in about thirty minutes, hence the clinical injection should be made only during a relative intermission of the fever. After this transient temperature reaction, durable defervescence follows, the natural consequence of the anti-infectious action common to all pseudosolutions injected intravenously. Quinin in the form of a pseudosolution seems to have an exceptionally powerful therapeutic action. Busquet is professor of physiology at the University of Nancy, and he has long made a study of intravenous medication. He cites the literature on the subject, mostly by French authors.

Paris Médical

June 2, VII, No. 22, pp. 437-484

32 The Coolidge Tube. G. Réchou.—p. 439.
33 *The True and Supposed Dangers of Roentgenotherapy. Béclère. —p. 445.
34 The Value of Roentgenotherapy. J. Belot.—p. 450.
35 *Roentgenotherapy of Tuberculous Processes in Bones. E. Albert-Weil.—p. 455.
36 *Roentgen Diagnosis of Stenosis of the Large Intestine. R. Bensaude and G. Guénaux.—p. 467.
37 Tardy Sequels of War Wounds of the Thorax. L. Ribadeau-Dumas.—p. 477.

June 16, No. 24, pp. 501-516

38 *Simplification of Prescribing. (Diversion sur la posologie.) P. Cornet.—p. 501.
39 *Hypertrophy of the Heart and Fitness for Military Service. H. Vaquez and E. Donzelot.—p. 502.
40 *Orthopedics at La Panne Hospital. L. Lamy.—p. 505.
41 *Clinical Unity of Traumatic Hysteroneuroses. J. Ferrand. —p. 509.
42 Localization of Projectiles by Reflected Light. A. Chéron.—p. 512.

33. **The True and Assumed Dangers of Roentgenotherapy.**—This entire number of the *Paris Médical* is devoted to radiology in general. Béclère's long experience, he states, has amply established that the true and only danger with radiotherapy is the excessive dose. Radiotherapy with the dose well calculated never does harm. It is only within the last fifteen years that we have had devices to measure the quality and quantity of the rays, so that scientific radiotherapy is only 15 years old. He insists that even with excessive dosage there is no danger except for the skin, although it might be unwise to push the exposures of spleen and thyroid beyond the point where the desired result has been attained. On the other hand, exposures of uterine fibromas or of the ovaries do not entail any danger for the normal tissue of the uterus or of organs in the vicinity, especially the bladder and intestines. The apprehensions in this respect that have been expressed have nothing to justify them. Over ten years' study of the subject has failed to reveal anything suggesting that a cancer can be aggravated by the exposures or its generalization hastened. The history of the case and present status will usually show when the malignant disease is becoming generalized. If radiotherapy is applied at this moment, the progressing generalization may be unjustly ascribed to the exposures. The repeated acute radiodermatitis on the hands of roentgenologists may entail an epithelioma, just as repeated irritation of the lips and tongue in smokers may bring on cancer which may be called either smokers' cancer or syphilitics' cancer. But if we say that the Roentgen rays breed cancer, then we must say also that traumatism, heat, tobacco, syphilis, tubercle bacilli and gastric juice also breed cancer.

The truth is merely that all irritations of the skin and mucous membranes which interfere with their nutrition, especially persisting ulceration, open the portals to the mysterious agent of cancer. He has encountered a case of epithelioma which had developed on an old ulceration following a burn from scalding water, but it yielded to the actual cautery. The epitheliomas of roentgenologists, like other epitheliomas of the skin, yield to Roentgen and radium treatment just as under other conditions. If radiologists after years of incessant work with the Roentgen rays may be justified in fearing a possible epithelioma on hands suffering from chronic trophic disturbances, their patients have nothing to apprehend unless possibly tardy ulceration may develop. He has never known of malignant degeneration in an ulceration of this kind, and the surgical treatment applied for it obviates this possibility. In conclusion he reiterates that there is absolutely nothing known that would justify the fear that radiotherapy applied to sound skin might generate a cancer in subjacent tissues.

35. **Roentgenotherapy of Bone Tuberculosis.**—Weil gives thirty-one radiograms of hands or feet before and after systematic roentgenotherapy to emphasize the great value of this mode of treating tuberculous processes in the long and the short bones. The Roentgen rays have a powerful local action, while natural or artificial heliotherapy has a general action, stimulating the natural defensive processes. With bone tuberculous processes, two or three weeks after the first exposure to the Roentgen rays the tissues feel less soft, as if they were drying out; the red and inflamed skin grows brownish and wrinkles, and the ulcerations start to heal from the outside in. The subsidence of the whole process can be followed in a series of radiographs. Weil usually exposes a short bone, from the dorsal and the plantar side, to a dose of 5 or 6 H units of very hard rays filtered through 2 mm. of aluminum. This exposure is repeated monthly for five or six months if necessary. For long bones and those of the metatarsus and metacarpus in young people, he uses a 4 mm. filter and 12 H units counted below the filter, or may even begin with 14 H units. Such doses cause considerable pigmentation or even desquamation; but with filters of this thickness, he says, they are absolutely harmless provided the intervals are not too short or the course kept up too long. Five or six series of irradiations generally completed the cure. The intervals at first were always four weeks, but the last exposures were sometimes delayed for six weeks. Nearly all the children thus treated were cured, and he has had a wide experience. There is scarcely a day in his service at the Trousseau hospital without a large number of small patients with tuberculous bone lesions. They come for their exposures but live at home in the same environment as before, which renders the success of the Roentgen treatment particularly impressive. "In short," he declares "for bone tuberculosis roentgenotherapy is the best treatment as this alone, without adjuvants, can determine the complete cure. In case of a fluctuating abscess or large sequesters it may not even be necessary to resort to the bistoury or the curet. Thanks to the Roentgen rays the sequesters are often spontaneously eliminated. Heliotherapy and sea air are always useful adjuvants, but they are not absolutely indispensable unless there are multiple tuberculous foci." He adds that those who believe that two or three applications of the Roentgen rays form the alpha and omega of radiotherapy must learn that the problem is a little less simple than this, but the solution is more effectual.

36. **Radiodiagnosis of Stenosis of the Large Intestine.**—Bensaude and Guénaux emphasize the diagnostic importance of the shadows cast by regions containing air or water. They regard them as pathognomonic of stenosis. They give nineteen illustrations of the typical findings with stenosis at different points, saying that they indicate better than anything else the existence of the stenosis and show whether it is probably amenable to operative measures, and which are to be preferred. This is also the only means at our command to control the results of operative intervention.

38. **Simplification of Prescribing.**—Delage proposes that a list should be published giving for each drug a fixed number indicating the suitable daily dose for an average adult, equally removed from the minimum and the maximum doses. This number thus established may be known as the pharmacologic equivalent or P.E. The tenth of this P.E. may be accepted as the therapeutic unit, T.U. The physician prescribes 1, 4, 8 or 10 T.U. according to the age of his patient. A prescription might read:

Potassium bromid Sodium bromid Ammonium bromid	āā	4 T.U.
Orange flower water Syrup of bitter orange bark	āā	Q.S.

Three spoonfuls a day. The medicine to be put up for ten days. The pharmacist will see that he must take ten times 4 T.U. = 4 P.E. of each of the active ingredients, dissolve them in 15 spoonfuls of the orange flower water and complete the whole by adding 15 spoonfuls of the syrup. The patient taking 3 spoonfuls a day will use up the whole in ten days.

39. **Alleged Hypertrophy of the Heart and Military Service.**—Vaquez and Donzelot comment that the lower location of the apex of the heart which is currently accepted as a sign of hypertrophy of the heart does not always mean this. The distance from the nipple is an unreliable measure, and it is not always easy to count the interspaces exactly. The first space below the clavicle may be between the clavicle and a rib or between two ribs. The most accurate procedure is to locate the articulation of the head of the clavicle with the first piece of the sternum, or the junction of this piece with the second, which always corresponds to the second rib. In a long narrow thorax the apex beat is far from the nipple, but the heart as a whole is shown by roentgenoscopy to be rather smaller than usual. And yet these are the cases most often labeled "hypertrophy" on account of the low position of the apex. Men with long narrow thorax are often frail; they grew too fast, and they are subject to dyspnea on exertion and palpitations. Scarcely a week or even a day passes, Vaquez and Donzelot say, that they do not have to rectify errors of this kind, men being sent back from the front on account of "hypertrophy," palpitations and dyspnea on exertion, when roentgenoscopy shows the heart normal and rather inclined to be smaller than usual. They protest against the neglect of roentgenoscopy by physicians; a radiologic equipment is rarely accessible to a physician, but in the matter of hypertrophy of the heart it is indispensable in dubious cases. The latest army regulations state that hypertrophy of the heart is not a cause for exemption. It justifies discharge

only when the area of heart dulness is increased in size and abnormal in outline, the heart rhythm is altered, and symptoms testify to some cardiovascular or kidney lesion.

40. **Surgery and Orthopedics at La Panne.**—Lamy describes with illustrations several ingenious procedures he noted on a recent visit to Depage's hospital. The "loop graft" is proving particularly useful for the leg. It is taken several inches above the area to be covered. The base of the flap is at the end nearest this area, and this end is not cut across. The upper end of the flap is turned back over and sutured to the skin at the upper end of the area to be covered. The graft thus forms a loop, the inside out. Later, the attached end is cut and the graft turned over again and sutured to the granulating area, bringing the outside outside once more. He saw one case in which a graft was brought in this way down to the leg, looping the loop twice. In treating fractures, Depage sometimes passes a wire to hold the stumps together bringing the ends of the wire out through a perpendicular tube with thumbscrew at the top. This permits tightening the wire, and when the parts are healed, three or six weeks later, the tube with the wire is easily pulled out. Another device is a wire looping around both stumps with traction on the wire through the muscles by a weight and pulley above.

41. **Traumatic Hysteroneuroses.**—Ferrand rejects the idea recently advanced of "reflex contracture" following a war wound, insisting that all such cases belong in the hysteria class.

Presse Médicale, Paris

May 24, XXV, No. 29, pp. 297-304

43 *Disturbance in Gait with Paralysis of External Popliteal Nerve and Device for Its Correction. J. Privat and J. Belot.—p. 297.
44 *Focusing Sunlight to Cure Warts. E. Vallet.—p. 299.
45 *Autoplastic Graft to Close Gap in Skull. C. Villandre.—p. 300.

May 31, No. 30, pp. 305-312

46 Technic for Intravenous Injection of Quinin. (Faut-il substituer le bichlorhydrate au chlorhydrate basique de quinine?) E. Jeanselme and A. Manaud.—p. 305.
47 *Extraction of Projectiles in the Lungs under Screen Control. E. P. de la Villéon.—p. 306.

43. **Correction of Paralysis of Extensor Muscles of the Leg.**—The Paris Surgical Society recently discussed the best means for artificial arthrodesis to remedy paralysis of the external popliteal nerve. Privat and Belot here declare that arthrodesis is the wrong treatment for paralysis of the extensor muscles. Operative treatment puts an end to all hope of recovering the normal use of the leg, and it creates an infirmity worse than the original trouble. On the other hand, the paralysis of the extensors can be easily corrected by wearing a strip of metal one end of which fits over a garter while the other end fits under the sole. This suppresses most of the movements of the antagonists and thus balances the muscles of locomotion as in normal conditions. There is no further limping, and conditions favor spontaneous subsidence of the paralysis. The article is illustrated.

44. **Focused Heliotherapy for Warts.**—Vallet insists that this method of treating warts has proved absolutely effectual in his experience. He used a magnifying glass 7 cm. in diameter, magnifying about 4 diameters, focusing the rays at 9 a. m. The magnifying glass is held at right angles to the sun's rays to focus them in a point on different parts of the wart in turn for three or four seconds each, guided by the patient's experiencing pain. Two typical cases of warts on the fingers are illustrated, showing the prompt subsidence of the warts of several years' standing. The first exposure was for a total of thirty seconds with very bright sunlight. There were a few seconds intermission when the patient felt a smarting. In five days the wart had materially changed its aspect and a second exposure was given at 5 p. m. The smaller wart was then completely cured, but a third exposure was given the larger wart before the cure was complete, the warty tissue being cast off, leaving smooth skin. When the focused rays smart, he brings the magnifying glass closer to the skin, thus reducing the concentration of the rays. After the wart has shrunken from the effect of the first and most intensive exposure, by the fourth or fifth day he clips off all the mortified parts of the wart with bistoury or razor, not causing any pain. The deep portion of the wart is thus ready to be exposed, and this drops off spontaneously in about a week. The pit left soon grows up to the level of the skin. His constant success with this focused heliotherapy suggests its possible application to superficial epitheliomas, fibromas, nevi—especially raised nevi—and possibly pigmented and hairy nevi.

45. **Autoplastic Repair of Gaps in the Skull.**—Villandre's experience with 106 patients with cranial defects has demonstrated to his satisfaction that nothing can compare with a bone-periosteum autograft for repairing the gap. In the 32 cases in which he applied this technic it proved a success in 100 per cent. A cartilage autograft succeeded in 96.8 per cent. of 48 cases. A sterilized bone plate from another subject caused trouble later in 18.2 per cent. of 22 cases, and a "bone hash" in 50 per cent. of 4 cases. He expatiates on the constantly good and permanent results with the bone-periosteum graft taken from the tibia.

47. **Extraction under Screen Control of Projectiles in the Lungs.**—De la Villéon has operated in ninety-seven cases by this technic and knows of its application by others to a total of 200 operations for extraction of 230 projectiles in lung tissue. All but one of the men recovered promptly and resumed their military service. A blunt instrument worked slowly into the parenchyma of the lung does not injure it, provided it keeps to a straight path and does not enter the hilus region. The cottony elasticity of the parenchyma of the lung, the blood vessels and air vessels, enables them to automatically yield the way to the rounded tip of the entering instrument, and allow it to pass without injuring them. The projectile is located beforehand by having the man stand with his arms over his head, and slowly turn around before the screen. The displacement of the shadow during rotation soon locates the projectile with precision. For the operation the anesthetized man lies on a frame that pivots on its longitudinal axis to apply this rotation principle at need. The tube is below. The narrow, blunt tipped forceps must be introduced slanting, through sound tissue. The danger points are the intercostal veins and the hilus. When the projectile is in the hilus, thoracopneumotomy is preferable. He has performed 730 operations for extraction of foreign bodies under screen control, switching on and off the Roentgen rays at will, alternating them with a bright orange-red light. He regards this economical radio-operative technic as a great advance as it avoids all useless mutilation. Its application to the lungs is the highest expression of this.

Progrès Médical, Paris

June 2, XXXII, No. 22, pp. 179-188

48 *The Complete Operation at the Advanced Station. A. Chalier.—p. 179.
49 Autoserotherapy of Pleural and Ascitic Effusions. L. Auguste.—p. 182.
50 The Army Medical Officer. R. Beaumesnil.—p. 185.

June 9, No. 23, pp. 189-198

51 *Loss of Memory of the Injury in the Wounded. R. Oppenheim.—p. 189. To be continued.
52 Statistics of War Wounds of the Eyes. E. Ginestous.—p. 195.
53 Butter Made from the Pellicles Discarded from Boiled Milk. E. Dupraz.—p. 197.

48. **The Complete Surgical Intervention at the Advanced Post.**—Chalier refers to the cases in which the maximal operation can be done at once, during the pre-infectious stage, and the wound be sutured at once. This treatment can be applied to nearly all the wounds from projectiles except where the tissues have been so crushed that recuperation is out of the question. If a general anesthetic is necessary, he prefers to wait for one, two or three days before attempting the complete operation, unless his hand is forced beforehand. He remarks that he personally has never seen any evidence that any chemical, by its direct action on a wound, is able alone to arrest the development of germs and ward off complications, but the mechanical clearing out of the wound, alone, without any antiseptics, has a long list of recoveries to its credit. The mechanical clearing out, however, exposes to grave danger if the wound is left open, and also if it is not complete, and the wound takes long to heal when left

open. The war is impressing more and more the threefold lesson that every wound should be systematically operated, and the operation should come at once after the injury and be complete, finishing with the repair of the region. He discusses the details of the technic for the preliminary exploration, the mechanical clearing out of the wound and the anatomic reconstitution of the region. By immobilizing the limb with the muscles relaxed he has sometimes been able to repair at once large defects. This method of treatment is applicable only in a comparatively quiet sector and when the surgeon can keep the patient till the end. The primary suture offers no danger if the man is kept under close supervision, the surgeon alert to interfere at the least feeling of pain or tension or fever. Small, shallow and seton wounds generally heal without intervention, and if the loss of substance is too extensive for repair, the primary suture cannot be applied. Primary suture is also out of the question when there is a foreign body in the wound. The only mishap in all his experience was with a deep wound in which an overlooked injury of an artery was responsible for secondary hemorrhage. The early primary suture is done in the first six, twelve or twenty-four hours, but the primary suture may still be possible even as late as the third, fourth or fifth day.

51. **Traumatic Amnesia.**—Oppenheim cites the opinions and experiences of various neurologists and psychiatrists on traumatic amnesia, and then analyzes 215 cases from his own service. The injury had been to the skull, requiring trephining, in 133 while in 15 there was shell shock without external trauma. The gap in the memory corresponding to the injury itself may suddenly fill up, but this rarely occurs. The lacunar amnesia, as he calls it, generally persists, but retrograde amnesia, extending back to the years before the injury, gradually corrects itself, as a rule, or with a little assistance. A number of examples of war amnesia are related belonging to these types. One young second lieutenant has lost all memory of events since his eighth year; his mind seems to be that of a child of 8. A private suffering from shell shock after a year at the front has no memories later than the shop he left to go to the war. About 50 per cent. of the trephined amnesia cases have retained their remembrance of matters connected with their trade or profession, but only 25 per cent. of the shell-shock amnesia cases so far as can be determined by oral examination.

Revue de Chirurgie, Paris

November-December, XXXV, No. 11-12, pp. 495-738

54 *Present Status of Treatment of War Wounds of the Knee. L. Bérard.—p. 495.
55 *War Wounds of the Foot and Ankle. E. Quénu.—p. 541. Continuation.
56 *Treatment at Advanced Station of Wounds of Skull and Brain. P. Mathieu.—p. 666.
57 Treatment at Advanced Station of Wounds and Fractures of Joints. J. Gatellier.—p. 709. Continuation.

54. **War Wounds of the Knee.**—The revolution in war surgery in the last few months is well shown by Bérard's statement that when the wounded knee is treated correctly the first day, from 80 to 90 per cent. of the wounded recover, and the knee is often solid and sometimes functionally capable. Even those who do not get proper treatment until septic complications have developed, escape most of the dangers which have heretofore rendered wounds of the knees the despair of patients and surgeons. He describes a number of typical cases, with twenty-five illustrations.

55. **Wounds of Foot and Ankle.**—In this long instalment of his monograph, Quénu summarizes 172 cases separately, bringing the number of illustrations to 266. The only wounds of the ankle which had serious results, under proper treatment, were those complicated with fracture of the heel-bone.

56. **Skull Wounds.**—Mathieu's seventy-one cases of war wounds of skull and brain gave a mortality of 38 per cent. He reiterates the importance of early shaving and disinfecting the skull and early intervention for every war scalp wound, no matter how trivial it may appear. He comments on the advantages of local anesthesia and of the natural expulsive force of the brain tissue when the patient coughs or strains. If the dura mater is sound it should be respected, but lumbar puncture is useful. All sequesters should be extracted; wick drainage usually suffices.

Correspondenz-Blatt für Schweizer Aerzte, Basel

June 9, XLVII, No. 23, pp. 721-752

58 Ear Disease in the Swiss Army. E. Schlittler.—p. 721. To be continued.
59 Operative Cure of Median Paralysis after Injury of the Elbow. H. Walthard.—p. 734.

Chirurgia degli Organi di Movimento, Bologna

I, No. 1, pp. 1-159

60 *Surgical Correction of Stiff Knee. (La mobilizzazione chirurgica delle anchilosi del ginocchio.) V. Putti.—p. 1.
61 *Prosthetic Surgery with Prostheses under Volitional Control. (Progressi attuali della plastica cinematica.) G. Vanghetti.—p. 71.
62 *The Normal and Pathologic Anatomy of the Bony Framework of the Foot, with special regard to Traumatic Lesions. F. Delitala.—p. 95.
63 *Fate of Free Bone Grafts. A. Serra.—p. 130.

Archives of Surgery of Organs of Motion.—This newly founded journal is issued by the director of the Rizzoli Orthopedic Institute of the University of Bologna, V. Putti, professor of orthopedic surgery. This institution was established in 1896, and has proved a leader in corrective surgery and orthopedics.

60. **Operative Mobilization of Stiff Knee.**—The seventy pages of Putti's comprehensive study of this subject are accompanied with sixty-one illustrations showing the fine outcome in a number of cases treated according to the technic described. He has applied it in a total of ten cases, with excellent results in all but two. In four the knee can be bent to 100, 95, 85 and 80 degrees; in one to 125, and in two to 50 and 40 degrees, when before, the ankylosis was complete. The interval since the plastic reconstruction of the knee is from two to four years in most, the shortest interval being eight months. He opens up the joint extensively, the incision carried high up on the thigh, and separates the joint surfaces. Then a square flap is cut from the fascia lata, high up on the thigh, and this flap is used to make a cap for the upper epiphysis which has been resected to fit. This cap is sutured in place. Sometimes he thus caps both of the epiphyses, but his results have been equally good with one cap. The patella is usually enlarged and has to be resected to normal proportions. He does not approve of complete eversion of the patella which some commend. In obtaining access to the joint, he cuts out the tuberosity of the tibia in order to turn back the patella and ligaments. When the fascia cap is in place, these parts are turned back and the tuberosity is held in place with a nail driven deep into the tibia, through the skin. The nail is made like a thumbtack, with an extension head; this enables greater pressure to be applied to the nail and also facilitates its removal. The tendon of the quadriceps is lengthened by cutting it across in steps and suturing it.

Putti regards it as a fundamental principle that the initial mobilization should be done exclusively by the patient. He illustrates the cord and pulley device with which the new joint can be thus passively exercised by the patient himself. Local electric and hot air baths, transient immobilization in a plaster cast in maximal extension or flexion, and other means to perfect and hasten the functioning of the new joint are applied as indicated. The knee is not used in walking before six weeks are past, and the rule is never forgotten that too much and too early use of the knee often does harm. He was able to dismiss his patients usually in three months with the knee usable. Improvement generally is progressive later.

61. **Vitalization of Artificial Limbs.**—As long ago as 1898 Vanghetti published articles urging surgeons in amputating to bear in mind the possible utilization of loops of muscles and tendons for direct autocontrol of the artificial limb to be used later, especially the fingers of an artificial hand. He has published a dozen works on the same subject since, calling attention to the possible advantages of such kinematic prostheses, plastic motors, the vitalization of artificial limbs. He here reviews the literature on the subject, and emphasizes

the principles for this kinetic plastics. Given two muscles with the possibility of reciprocal antagonistic action, united to form a loop which can slide on a support communicating with the prosthesis, a dual alternating motion can be imparted to the prosthesis by means of only one point of connection. A loop formed of two smaller alternating loops, interlocking like the links of a chain, may be able to impart three sets of movements to the prosthesis by the four muscles and three points of connection. There has been little practical experience with kinetic plastics to date. The tentative efforts of various surgeons with only a case or two each scarcely permit as yet definite conclusions as to the best mode of preparing the stump for autocontrol, but the feasibility of kineplastic amputations has been abundantly demonstrated, especially in Italy.

62. **The Skeleton of the Foot.**—This illustrated article is the result of study of radiograms of the foot, the accumulations of fifteen years at the Rizzoli Institute. The aim was to learn which exposure of the foot gives the most information as to its bony framework, the normal relations between the different bones and supernumerary bones, and the criteria for pathologic conditions. The most instructive exposures are the dorsoplantar—the compressing tube parallel to the axis of the skeleton of the foot; and with the external margin of the foot lying on the sensitive plate—the sole and compressing tube exactly perpendicular to the plate. Normal radiograms thus obtained show constant points of pseudoatrophy which must not be confused with true destructive processes.

63. **Bone Grafting.**—Serra reports the microscopic findings later in five cases. Scraps were obtained for examination during a minor operation several months later in the first group and at necropsy over a year later in one case. In this case an interposed flap of fascia tissue in the joint had evidently retained its vitality and answered perfectly the desired purposes. But the implanted bone had lost its vitality and had shrunk and fractured. None of the bone grafts seemed to have retained their vitality.

Gazzetta degli Ospedali e delle Cliniche, Milan

May 6, XXXVIII, No. 36, pp. 553-568

64 Differential Diagnosis of Lymphangioma and Elephantiasis. P. Dagasso.—p. 556.
65 Bilharziosis in Italian Colonies in Africa. F. Mazzone.—p. 566.

May 10, No. 37, pp. 569-576

66 Operative Cure of Purulent Synovitis in Woman of Seventy-Two. N. Federici.—p. 571.
67 Patriotism in Prescribing. (Nazionalismo scientifico.) E. Villa. —p. 575.

May 13, No. 38, pp. 577-592

68 *Sugared Petrolatum for Dressing War Wounds. A. S. d'Emidio. —p. 580.
69 *Tint of Amniotic Fluid as Sign of Fetal Monstrosity. R. Costa. —p. 583.

68. **Treatment of War Wounds.**—In the course of his remarks on the present status of wound treatment, d'Emidio reports excellent results from the use of petrolatum containing 4 per cent. cane sugar, with or without 1 per cent. iodoform. When the tissues seem to be torpid and healing does not progress well, the epithelium-stimulating action of scarlet red may be utilized. He applies it in the form of a salve but only to the edges of the wound, alternating it with physiologic solution. If plastic repair is necessary, he warns that pedunculated flaps always give better results and heal quicker.

69. **Diagnostic Importance of Tint of Amniotic Fluid.**—Costa recalls that a greenish tint indicates fetal suffering and a reddish tint maceration, but it is not generally known that a yellowish tint indicates escape of cerebrospinal fluid. This never occurs with a normal fetus, and when it is discovered it permits several presumptions, among them being that delivery will be spontaneous, as the escape of the fluid reduces the diameter of the head. Another presumption is that the prognosis as to the viability of the fetus must be reserved, as the causal hydrocephalus, encephalocele, spina bifida, meningomyelocele or other monstrosity is scarcely compatible with extra-uterine life.

Pediatria, Naples

June, XXV, No. 6, pp. 321-384

70 *Epidemic Cerebrospinal Meningitis. A. Longo.—p. 321.
71 *Vaccine Prophylaxis and Vaccine Treatment of Pertussis. G. Caronia.—p. 358. R. Pastore.—p. 367.

70. **Epidemic Cerebrospinal Meningitis.**—Longo analyzes the experiences at Catania where there were reported 21 cases of this disease in 1915, 113 in 1916 and 13 to date this year. All ages were represented, but 65 per cent. were in children under 15, including 8 less than a year old and 12 under 2. Adenoids were common and seemed to afford a predisposition to the disease. Fully 38 per cent. of the mortality occurred in the younger soldiers. The waves of the epidemic were in winter or spring; colds and sore throats evidently afford a predisposition. In 2 of the cases the meningitis developed immediately after an injury of the head, a fall from a bicycle or a blow on the back of the head. In another case a nursling of 7 months developed convulsions eight hours after its mother had had a severe fright, seeing her son fall from a high wall. The convulsions subsided, but three days later the symptoms of meningitis became apparent.

The bacteriologic findings show, he says, that the morphology and biology of the Weichselbaum diplococcus are far from being definitely known. The uncertainty of agglutination and the extreme efficacy of the antiserum in some cases and its inefficiency in others also demonstrate this. In some cases the onset suggested influenza. Headache was a constant symptom, as also rigidity of the back of the neck although of widely varying degree. Two children complained of pain in the spine and legs, limited to the muscles and skin which were extremely sensitive; pressure on the nerve trunks was not especially painful. The general mortality in 134 cases was 45.1 per cent. but it was only 33.7 per cent. in the cases with thorough serotherapy. In 19 cases in Longo's own practice, given systematic serotherapy, none died and there were no appreciable sequels, while in 12 not given the serum and in 3 given only one or two injections in all, only 2 of the 15 recovered completely; 7 died and the others were left with deafness and mental impairment, generalized spasms or hydrocephalus, the latter plus amaurosis in one case. This difference was the more striking as, except for serotherapy, conditions were much alike in all the cases. Adhesions obstructing the interflow of the cerebrospinal fluid were probably responsible for the cases in which the serotherapy failed. The nephritis which complicated the meningitis in some cases yielded promptly with the other symptoms to the serotherapy. The serotherapy must be begun early and pushed; there are no contraindications, he declares. Many factors conspire to render intraventricular injection ineffectual, and explain the poor results obtained with it to date and also with Bériel's method of injecting the antiserum through the sphenoidal fissure in the orbit. One of his patients presented symptoms of severe anaphylaxis at the third injection and he changed to a silver salt, but later resumed the antiserum without harm.

71. **Vaccine Therapy of Whooping Cough.**—Caronia reports 61.28 per cent. cured, 32.25 per cent. improved and only 6.45 per cent. not influenced out of 155 children with whooping cough given systematic vaccine treatment. The entire data are tabulated. Some required only from three to five injections, others up to ten. In the cases with negative results the Bordet-Gengou bacillus was generally not found in the sputum. All but six of the 155 were out-patients. The injections were made subcutaneously or into a muscle. The pertussis had been under way from five to forty-five days in all but three. A large number of the children were less than a year old.

Policlinico, Rome

June 10, XXIV, No. 24, pp. 757-784

72 *Suggestions to Improve the Ophthalmologic Service in the Army. G. Cirincione.—p. 757.
73 Advantages of Median Longitudinal Incision of the Patella. P. Nigrisoli.—p. 762.
74 Treatment of Malaria in Soldiers. L. Taussig.—p. 763.

72. **The Ophthalmologic Service in the Army.**—Among the suggestions advanced is that each army should have a central

hospital for care and treatment of the eyes, wounded or diseased. At present such cases are scattered through the general hospitals or in small eye infirmaries. Rome has six establishments of the latter kind. Equally good results with great saving in equipment and personnel would be realized by consolidating them into one large institution with separate quarters for the cases of simple ophthalmia, isolating those of gonorrheal origin; other quarters for trachoma cases, others for factitious ophthalmia, and a fourth department for observation and study of cases. In his rounds as inspector he has encountered 200 cases of loss of one or both eyes from purulent conjunctivitis going without specialist care until too late. Out of 50,000 men inspected, 2,000 had induced conjunctivitis, not to mention the others who had succeeded in aggravating an existing eye trouble. Only an experienced specialist can sift out these factitious cases—another argument in favor of a single specialist center with each army. In conclusion he lists a number of eye affections which should bar from military service unless capable of correction. The ten entailing absolute rejection are complete ptosis, covering the cornea; serious deformity of the lids; permanent obstruction of the lacrimal canals; essential blepharospasm; exophthalmos with the cornea protruding not less than 1 cm.; enophthalmos, and also xerosis of the entire conjunctiva; incurable corneal complications of trachoma; detachment of the retina; total opacity of the lens, and vision of less than 3/10 of normal for both eyes or when vision in one eye is below 1/20. These restrictions as to vision apply also when spherical correction or operation for pterygium does not bring vision above these figures. Paralytic and cicatricial lagophthalmos is also a bar to military service if it cannot be corrected by operative measures. Recruits with trachomatous conjunctivitis should be given hospital treatment and segregated in special troops. Hemeralopia and hemianopsia entail temporary or relative incapacity and simple conjunctivitis calls for hospital treatment or temporary incapacity, as also keratitis and blepharitis. Concomitant squint is no cause for exemption, but binocular diplopia and paralytic squint may temporarily incapacitate.

Riforma Medica, Naples

May 26, XXXIII, No. 21, pp. 561-588

75 Italian Contributions to the Bacteriology of Typhoid. A. Ferrannini.—p. 561.
76 Dysentery from Protozoa. C. Vallardi.—p. 563. To be continued.
77 *Valvular Lesions in Soldiers on Active Service. G. Galli.—p. 568.
78 *Mask for Stethoscopy of the Mouth. A. Campani.—p. 573.

77. **Valvular Lesions in Soldiers on Active Service.**—Galli gives the detailed history of fifteen men with a valvular affection serving at the front, discussing their cases from the medical, the medicolegal and the military standpoints. These fifteen are only a fraction of the number actually encountered in his division in a brief period. In some with aortic insufficiency and reflux murmur, the disturbance in the circulation is so slight that the men are able to keep up with most fatiguing work. There is no doubt, he says, that many soldiers with valvular trouble are capable of useful service, not demanding more of them than they can safely render. His idea is that anyone capable of useful work in civilian life should be considered fit for military service of some kind. The medical officer of the regiment, knowing his men, can tell which should be called on only for light duty. This selection by the medical officer is expressly stipulated in the Italian regulations.

78. **The Mouth Stethoscope.**—Campani recalls the work of Cardarelli and Galvagni on the information to be learned from auscultation of the oral cavity in respect to conditions in the chest. He gives an illustrated description of a mask to fit over the open mouth to focus and magnify the auscultation.

Brazil-Medico, Rio de Janeiro

May 26, XXXI, No. 21, pp. 175-183

79 *Polyneuritis Following Electric Shock from Live Wire. E. Tornaghi.—p. 175.
80 Puncture of the Corpus Callosum for Hydrocephalus. C. Wallau.—p. 177. Continuation.

79. **Polyneuritis from Electric Shock.**—The man of 30 was painting a trolley pole when he came in contact with a live wire carrying 2,200 volts. There was a mild burn of the left hand and forearm, and a month later some weakness and atrophy in this arm were noted. Five months later he met with a similar accident, with a current of 600 volts. He was in contact with the live wire this time for perhaps two minutes, and the right back showed burns of the first degree. They healed in ten days, but there has been persistent paresis during the nearly year and a half to date. At first the paralysis of both legs was complete and the pain in the various main nerve regions was intense and persistent, night and day, for ten days, with but slight relief from sedatives. There was also complete retention of urine at first. The man gradually improved, being able to begin to feed himself in about a month, and a few weeks later to get about with a cane. During eight years of service as physician to the electric supply company, Tornaghi has encountered only ten electric accidents and none of the other patients displayed any tendency to the polyneuritis so pronounced in this case nothwithstanding the slight injury of the skin. The man was robust but the electric shock five months before may have predisposed the trunk nerves to the agonizing neuralgia.

Prensa Medica Argentina, Buenos Aires

May 30, III, No. 36, pp. 389-400

81 Vaccine Therapy of Diphtheria. (El informe del Instituto Bacteriologico del Departamento Nacional de Higiene sobre la Haptinogenina difterica.) J. Mendez.—p. 389.
82 *Differential Diagnosis of Cancer by Albumin in Stomach Content. C. B. Udaondo.—p. 391.
83 *Toxicity of Normal Beef Serum. A. Sordelli and G. Fischer.—p. 393.
84 Clinical Study of Acute Abdominal Disturbances. R. E. Pasman.—p. 394. Continuation.
85 Chapter from Autobiography. E. R. Coni.—p. 397.

82. **Dissolved Albumin in Stomach Content as Sign of Cancer.**—Udaondo has been applying the Wolff-Junghans quantitative test in thirty cases of various stomach affections, twenty-one of simple achylia and eleven of cancerous achylia. In the cases of simple achylia the amount of dissolved albumin found in the stomach content, one hour after a test breakfast, ranged from 20 to 40 units while in the known cancer cases the range was from 200 to 400. This range was paralleled by the cases with hyperacidity, but under all other conditions the range was only from 10 to 40. The test is simple, merely the addition of 1 c.c. of the reagent to amounts of filtered gastric juice ranging from 0.025 c.c. to 1 c.c., each in 10 c.c. of distilled water. A white opaque zone forms at the line of junction of the two fluids. The amount of dilution in each of the six test tubes is the index. The reagent is a mixture of 0.3 gm. of phosphotungstic acid; 1 gm. pure hydrochloric acid; 20 gm. 96 per cent. alcohol, and distilled water Q.S. to 200 gm.

83. **Toxicity of Normal Beef Serum.**—Guinea-pigs died in from ten minutes to three hours after intravenous injection of 1 or 2 c.c. of fresh normal beef serum, but rabbits and dogs seemed to bear it without harm except possibly transient dyspnea. In other series of experiments, four guinea-pigs bore without harm from 1 to 6 c.c. of beef serum heated to 56 C. for half an hour on two successive days. Two others died in less than three hours, and the seventh had transient dyspnea. Of two others injected with 6 or 8 c.c. of the serum heated four times, the first bore it without disturbance; the other died in three hours. Further trials with fresh serum tested for its hemolytic and agglutinating properties showed that all hemolytic properties could be removed by treating with animal charcoal. Serum thus treated, however, killed guinea-pigs just the same as untreated serum. Heating the serum to 56 C. also annuls the hemolytic property, but does not always render it nontoxic for the guinea-pig.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

May 5, I, No. 18, pp. 1433-1526

86 *Spasmophilia a Phenomenon from Loss of Calcium. H. A. Sthecman.—p. 1436.
87 *Diagnosis and Serotherapy of Epidemic Meningitis. J. Hekman.—p. 1448.
88 Formation of Creatin from Arginin in Animal Organism. B. C. P. Jansen.—p. 1457.

89 *Thyrogenous Heart Trouble. P. H. Enthoven.—p. 1462.
90 Varying Action of Scopolamin with Age of the Solutions. H. Bolten.—p. 1466.
91 Painless Delivery; Child Falls in Privy Vault. J. J. T. Doyer.—p. 1469.

86. **Spasmophilia Result of Lack of Calcium.**—Stheeman is physician in chief of the children's hospital at 's-Gravenhage, and his extensive experience has convinced him that an over-excitable weakness of the nervous system is responsible alike for spasmophilia in young children and the spastic constipation, colic pains in the domain of the mesenteric plexus, enuresis and nervous pallor in older children and for asthenia in adults. The signs and symptoms of all these conditions testify to a like cause for all, a constitutional inferiority of the nervous system, of the digestive tract or of the processes of development or all combined—nervous, peptic or trophic asthenia. The asthenic habitus can be plainly detected in the spasmophilic child as well as in the easily fatigued adult. The vegetative and vasomotor spasms in older children are the equivalent for the tetany of the younger children.

Two of the best known facts in the history of tetany are its connection with the parathyroid bodies and with the metabolism of calcium. Abnormally low calcium content of the blood seems to accompany spasmophilia and to be found exceptionally frequent with the nervous peptic and trophic disturbances of older children and adults. He tabulates the findings in fifty-three children from early infancy to 14 years old; in the twenty-three with abnormally low calcium content in the blood, four had pronounced tetany and all the others belonged to the nervous-peptic-vasomotor dystrophic asthenia group or, as he prefers to call it, the group of constitutional spasmophilic asthenia in children of all ages. The Chvostek sign he regards as equally significant with the Erb sign, from this standpoint. The logical deduction is that means to arrest the demineralization of calcium are called for in treatment of this spasmophilic asthenia, and his success with phosphorus has confirmed the correctness of his assumption. Phosphorus-cod liver oil seems to have a specific action on all forms of spasmophilic disturbances. Administration of calcium itself may give transient symptomatic benefit, but the phosphorus-cod liver oil seems to remove the cause. Magnesium and strontium act like calcium; some think they merely deaden the central nervous system so it does not feel stimuli. Phosphorus, on the other hand, seems to restore to the tissues the power to retain calcium. His tabulated data show in every case but one the return toward normal of the calcium content of the blood under phosphorus treatment. The single exception was in a child with pulmonary tuberculosis. Any infection, intestinal trouble, etc., should of course be given proper treatment. With chronic dyspepsia, the diet must be scrupulously individualized, remembering that children with chronic constitutional intestinal disturbances do not thrive on much milk. With rachitis, likewise, a milk-poor diet is very important. In conclusion Stheeman remarks that the glands with an internal secretion probably have much to do with this calcium demineralization. We cannot refer to its consequences as a spasmophilic diathesis. The derangement in the metabolism is the same for all, but the morbid manifestations depend on the eventual diathesis, the constitutional predisposition, in each case.

87. **Epidemic Meningitis.**—Hekman comments on the difficulty of differentiating this disease, especially in children. Neither the clinical phenomena from the meningitis itself or from the meningococci have specific import. Bacteriologic findings alone are conclusive. He reviews recent research and experiences which seem to show that when a distinctly favorable influence from intraspinal injection of antimeningococcus serum is not soon apparent, it is unwise to continue it. In such cases, he continues to withdraw fluid by lumbar puncture but injects the antiserum only intramuscularly. By this means the antiserum becomes so diluted in the blood that there is no danger of injuring the phagocytes which is liable in some patients from the foreign serum in the concentration in the cerebrospinal fluid. This varying effect on the phagocytes may explain the wide differences in the action of serotherapy in different cases.

In 1907, forty-one cases were recorded in the Netherlands, fifty-four in 1915, and 226 in 1916. Hekman has had twenty-one cases in his service at the Rotterdam public hospital in the last two years; 78 per cent. were under 15, and the disease had not been recognized for several days in some of them. Many recovered in a few days under serotherapy; in a few others the disease was of the fulminating type. In some it ran an extremely chronic course, leaving permanent injury of vision and hearing, and emaciation. In some patients the opisthotonos was so extreme that there was fear of decubitus from the pressure of the back of the head on the lumbar region. The resulting clinical picture was like that with syphilitic hydrocephalus.

89. **Thyrogenous Heart Disturbances.**—Enthoven remarks that the subjective and objective heart disturbances induced by uterine myomas and by goiter may in time entail grave conditions, resembling apparently in every respect those with lost compensation. Compression by the goiter, irritability of the nervous system, and abnormal secretory conditions in the thyroid may all contribute to the clinical picture of thyroid origin. He found considerable compression of the trachea in 15 per cent. of 100 operative goiter cases, but in five of them—average age 24—the cardiovascular system seemed normal. The others—the average age 35—had severe circulatory disturbances. A pulse of 160 was not infrequent, and still more frequent were rapid fluctuations in the pulse under slight exertion and emotions. The goiter of the youngest patient, 17 years old, had developed within five months, with much enlargement of the heart outline and tachycardia. The nervous disturbances usually indicate a toxic action on the heart nerves. A low blood pressure and dilatation of the small arteries evidently cooperated in the acceleration of the pulse. The oldest patient, 71, with goiter for thirty years, showed slight heart disturbances. In 42 per cent. of the total 100 cases there was decided cardiovascular disturbance. A pulse of 170 or 180 was not uncommon. In 79 per cent. there was exophthalmic goiter, and in a still larger proportion various nervous disturbances. In the total 100 cases the most serious heart disturbances always accompanied the smaller and more recently growing goiters. Rest of body and mind and various therapeutic measures under which the thyroid subsides in size, affected also favorably the heart disturbances. The pulse grew slower as the first sign of improvement. In three patients the dilatation of the heart was the only sign of cardiovascular trouble and he can suggest no explanation for these cases. A rapid, unstable pulse should always suggest examination of the thyroid before ascribing it exclusively always to heart disease.

Hygiea, Stockholm

May 31, LXXIX, No. 10, pp. 465-512

92 Series of Wassermann Tests Show Characteristic Curves Important for Prognosis. G. Ahman.—p. 465.
93 *Soldier's Right to Refuse Operations. L. Norrlin.—p. 476.

93. **Right of the Soldier to Refuse an Operation.**—Norrlin discusses the conditions and regulations in this respect in Germany and Austria, studying them from both the medico-legal and the military standpoints. The question is important not only for military but for civilian circles and from the standpoint of both sociology and national economics. By persuasion and reasoning it is generally possible to obtain the consent for a needed operation, but if not, there may be conditions, he thinks, in which it is deemed best to perform the operation despite the patient's refusal to consent. There has been considerable literature published on the subject in the last year or two. Von Eiselsberg denounces as an infringement on personal liberty any attempt to compel a man to submit to an operation against his will. Others, on the contrary, insist that the wonderful success of the war surgery of the day should justify the military authorities in relieving the wounded of the decision as to whether they are to be operated on or not. Norrlin regards the obstinate refusal to permit a rational corrective operation as on a par with self-mutilation to avoid military service or to secure an indemnity.